United States
Department of
Agriculture

Forest Service

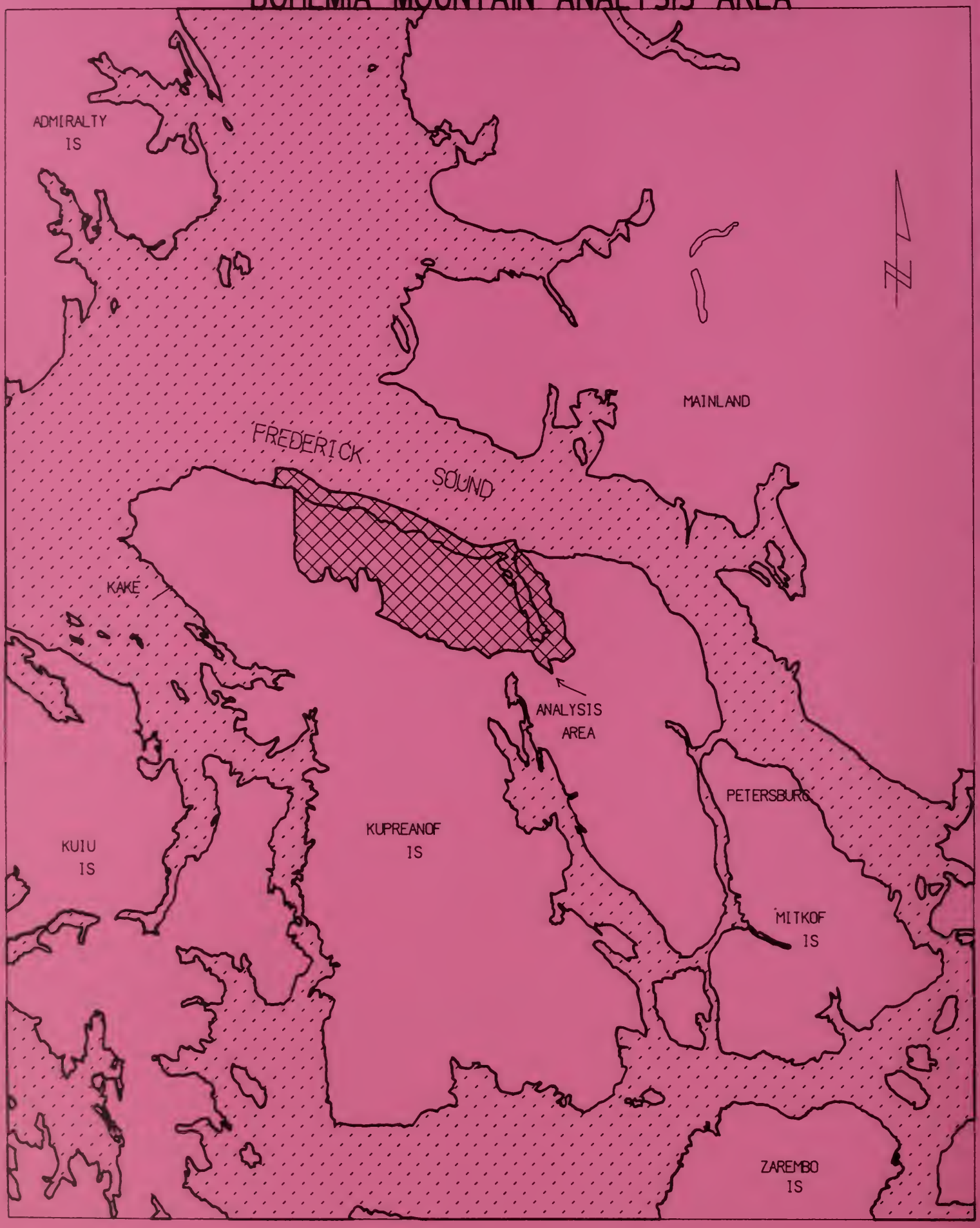
Tongass
National
Forest
R10-MB-153
September 1991

Bohemia Mountain Timber Sale

Final Environmental Impact Statement

Stikine Area

VICINITY MAP OF BOHEMIA MOUNTAIN ANALYSIS AREA



Final Environmental Impact Statement

Bohemia Mountain Timber Sale

U.S.D.A. - Forest Service
Tongass National Forest
Stikine Area
September 1991

Responsible Agency:	*U.S.D.A. Forest Service* *P.O. Box 309* *Petersburg, Alaska 99833*
Responsible Official:	*Laura L. Nelson* *Acting Forest Supervisor* *Stikine Area* *Tongass National Forest*
For Further Information Contact:	*Tamara S. Malone* *IDT Leader* *P.O.Box 309* *Petersburg, Alaska 99833* *(907) 772-3841*
Appeals Must Be Received:	*Within 45 days of the publication date of the Notice of Record of Decision for the Final EIS in the Petersburg Pilot. Appeals must be addressed in writing to Michael A. Barton, Regional Forester, Federal Office Building, Box 21628, Juneau, AK 99802-1628.*

Abstract: This Final Environmental Impact Statement describes the impact of five action alternative approaches and one "no action" approach to harvesting timber in the Bohemia Mountain study area.

printed on 50% recycled paper

Summary

Summary

This document is the result of an analysis to determine whether to implement or defer a timber sale on north Kupreanof Island under the direction of the current Forest Plan. The project proposed in this document is one or more short-term timber sales designed to supply timber for the Stikine Area independent timber sale program. Independent short-term timber sales are allowed by the Forest Plan in order to maintain a supply of timber for southeast Alaska. This analysis will also determine whether or not to recommend all or portions of 12 miles of Duncan Salt Chuck Creek for inclusion in the National Wild and Scenic River system. The analysis area is identified in the Forest Plan as land use designation (LUD) II, "which emphasizes management in a roadless state while allowing for wildlife and fish habitat improvement projects, roads that are vital transportation links, and timber harvesting to control insect infestations", and LUD IV, "for intensive resource use and development where emphasis is primarily on commodity or market resources."

Five action alternatives and a no action alternative were considered in this Final EIS. New Perspectives concepts are incorporated as part of this analysis. This project plan is a prototype for the Tongass National Forest to determine the suitability of a river for possible inclusion in the National Wild and Scenic River system outside the Forest Plan revision process.

Issues

The alternatives were developed to address eight issues defined through public involvement and management concerns. The eight issues follow:

1. Wildlife habitat
2. Water quality and downstream anadromous fish habitat
3. Subsistence resources and users
4. Economically viable timber sale
5. Kake/Portage road connection
6. Potential impacts on Wilderness and associated values
7. Maintenance of scenic quality
8. Wild and Scenic River designation

Alternatives Considered

Alternative 1

The "No Action" alternative would defer harvest of timber, construct no new roads, and would not recommend Duncan Salt Chuck Creek for designation in the National Wild and Scenic River system.

Mainline Road

Two alternative locations were considered for a segment of Collector Road 6030 that would parallel Duncan Salt Chuck Creek. After field reconnaissance, the south route remained unchanged from the Draft. Portions of the north route were dropped to provide a better overall transportation route.

The south route is located near the top of a ridge that parallels the creek. All ditches draining from this route will drain away from Duncan Salt Chuck Creek. This route would require the permanent installation of two bridges, one that crosses the creek running from an unnamed lake into Duncan Salt Chuck Creek and one that crosses Duncan Salt Chuck Creek itself. Two additional bridges would be required to gain access to proposed units on the west side of Bohemia Mountain. One that would cross Duncan Salt Chuck Creek and one that would cross a V-notch drainage adjacent to Duncan Salt Chuck Creek.

The north route will cross 14 small Class III drainages as well as Duncan Salt Chuck Creek. All crossings are located in stable sections of the drainages, requiring 24" to 36" metal culverts. The crossing of Duncan Salt Chuck Creek will require a 40 to 50 foot bridge.

Alternative 2

This alternative would emphasize biodiversity and would have moderate harvest while maintaining older age forest blocks, meeting wilderness concerns, and minimizing stand fragmentation. Approximately 24.0 million board feet of timber on 830 acres would be harvested. An estimated 13.8 miles of specified road[1] would be constructed.

Alternative 3

With an economics and non-fragmentation objective, this alternative was developed to maintain the eligible status to its highest classification of Duncan Salt Chuck Creek and maintain wildlife habitat since units are concentrated in Portage Bay and fragmentation is minimized. It is the only alternative that is anticipated to have a net positive return. Approximately 12.2 million board feet of timber on 367 acres would be harvested. An estimated 1.4 miles of specified road[1] would be constructed.

Alternative 4

This alternative emphasizes timber cutting while still maintaining visual quality and seeks amenity protection while maintaining options for future management. No new harvest units would occur in Portage Bay, thus allowing existing units to "green up." Approximately 20.9 million board feet of timber on 871 acres would be harvested. An estimated 18.6 miles of specified road[1] would be constructed.

Alternative 5

Alternative 5 has the goal of harvesting the most volume and building the Kake to Portage Bay road connection. Approximately 38.1 million board feet of timber on 1416 acres would be harvested. An estimated 28.9 miles of specified road[1] would be constructed.

Alternative 5A

This alternative also emphasizes high-volume harvest and was designed the same as Alternative 5, but it does not build the road connection and harvests 4.2 million board feet less volume. Approximately 33.9 million board feet of timber on 1,270 acres would be harvested. An estimated 19.2 miles of specified road[1] would be constructed.

---

[1]The location and construction standards of these roads are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

Helicopter Logging

To provide the opportunity to harvest otherwise inaccessible timber, helicopter logging is planned for each action alternative except Alternative 4. Helicopter units are the same in all of the action alternatives.

Consequences

Each alternative provides a different mix of resource outputs that emphasize different resource values.

Wildlife Habitat

All action alternatives would harvest between 9 and 41 acres of the 9,131 acres identified as high value wildlife habitat. All alternatives defer timber harvesting within a 500-foot strip of beach fringe and within a 1,000-foot buffer around estuaries.

Water Quality and Fish Habitat

The alternatives are compared for their relative contribution of risk to fisheries based on several measuring factors. These include a combination of total length of roads, total number of stream crossings, total length of buffered and unbuffered Class III stream channels, and total acres of harvest within fish stream watersheds. While any activity poses some risk to resources, by following Best Management Practices and Aquatic Management Habitat Unit guidelines, no measurable effect is anticipated and there should be no habitat-related reduction in the fish population. Alternative 5 would pose the greatest potential risk to fisheries in terms of the number of Class I and II watersheds entered and total existing and proposed road miles, stream crossings, and acres harvested. Alternative 3 would pose the least potential risk to fisheries in terms of the number of Class I and II watersheds entered and total existing and proposed road miles, stream crossings, acres harvested, and unbuffered, Class III streams.

Subsistence Resources and Users

Increased roaded access ranging from 1.4 to 28.9 miles of permanent specified road may improve access for subsistence use, and may therefore increase competition for subsistence resources.

Timber

Only Alternative 3 is identified to show an immediate positive net return. The negative net returns on the other action alternatives reflect the capital investment in specified road construction.

Kake/Portage Road Connection

Alternative 5 is the only alternative that would build the road connection and allow timber from Bohemia Mountain to be hauled to Portage Bay Log Transfer Facility (LTF). All other action alternatives would also use the Little Hamilton LTF and maintain two existing separate road systems.

Wilderness

Alternative 5 is the only alternative that would have an impact on the wilderness recreation opportunity spectrum (ROS) setting, where about 160 acres of the Petersburg Creek-Duncan Salt Chuck Wilderness could be affected due to activity occurring adjacent to the Wilderness.

Visual Resources

All of the action alternatives would have visual effects on viewers travelling in Portage Bay and along the Frederick Sound shoreline. Generally, the short term effects of the helicopter-logged clearcuts would be less than those associated with the cable-yarded units, because fewer roads would be necessary and more vegetation would be left standing after harvest.

Wild and Scenic River Designation

All action alternatives except Alternative 3 would propose designating Segment 1 (3.9 miles within the Wilderness) as a Wild River. Alternative 3 would defer analysis of the river to the Forest Plan Revision process which will be completed after this Final Environmental Impact Statement (EIS). Alternatives 2, 5, and 5A would propose Segment 2 (from the Wilderness boundary upstream to Bohemia Lake) as a Scenic River. Alternative 1 would propose no designation for the entire creek; Alternative 4 would propose no designation for Segment 2.

Mitigation of Consequences

If an action alternative is selected, the following steps are required:

(a) Minimum 330-foot buffers will be maintained around eagle nest trees.

(b) The wildlife maintenance areas (combined Habitat Suitability Index (HSI) .7 or greater) will be deferred from timber harvesting in all alternatives.

(c) All known or discovered cultural sites will be protected. If additional sites are discovered once the sale is in operation, protective measures will be taken under the timber sale contract provisions.

(d) Full bench construction and removal of excess excavated material will be required on designated areas for soil stability.

(e) Pursuant to the Tongass Timber Reform Act, commercial timber harvesting within a buffer zone no less than one hundred feet in width on each side of all Class I streams and those Class II streams which flow directly into a Class I stream will be prohibited. In addition, stream protection will include provision of buffer areas and other protective actions consistent with aquatic habitat management unit (AHMU) guidelines pertaining to (1) unstable banks, (2) temperature sensitivity, (3) sedimentation, and (4) large, woody debris for rearing habitat, nutrient retention, and streambed stabilization.

(f) Class III channels will receive appropriate protection according to Best Management Practices (BMP's, see Forest Service Handbook 2509.22). See unit descriptions, Appendix F, for specific BMP's.

(g) The visual resource will be protected to the extent required to meet the visual quality objectives for the Bohemia Mountain analysis area as stated in the current Forest Plan. Landscape design principles will be used to locate and design rock pits, sort yards, and other related facilities.

(h) Rock pit and roadside rehabilitation will be implemented in areas that are heavily disturbed.

(i) Road construction impacts within LUD II lands will be kept within the approved road corridor to the extent practicable.

(j) Rock pits which must be developed within LUD II areas will be analyzed for future suitability and need for road maintenance. Those not needed will be rehabilitated according to an approved pit plan.

Alternative Preferred by the Forest Service

After reviewing all resource impacts, consequences, and opportunities, Alternative 5A was identified as the preferred alternative. Mitigation measures as described on pages 2-22 and 2-23 would be applied.

Contents

Contents

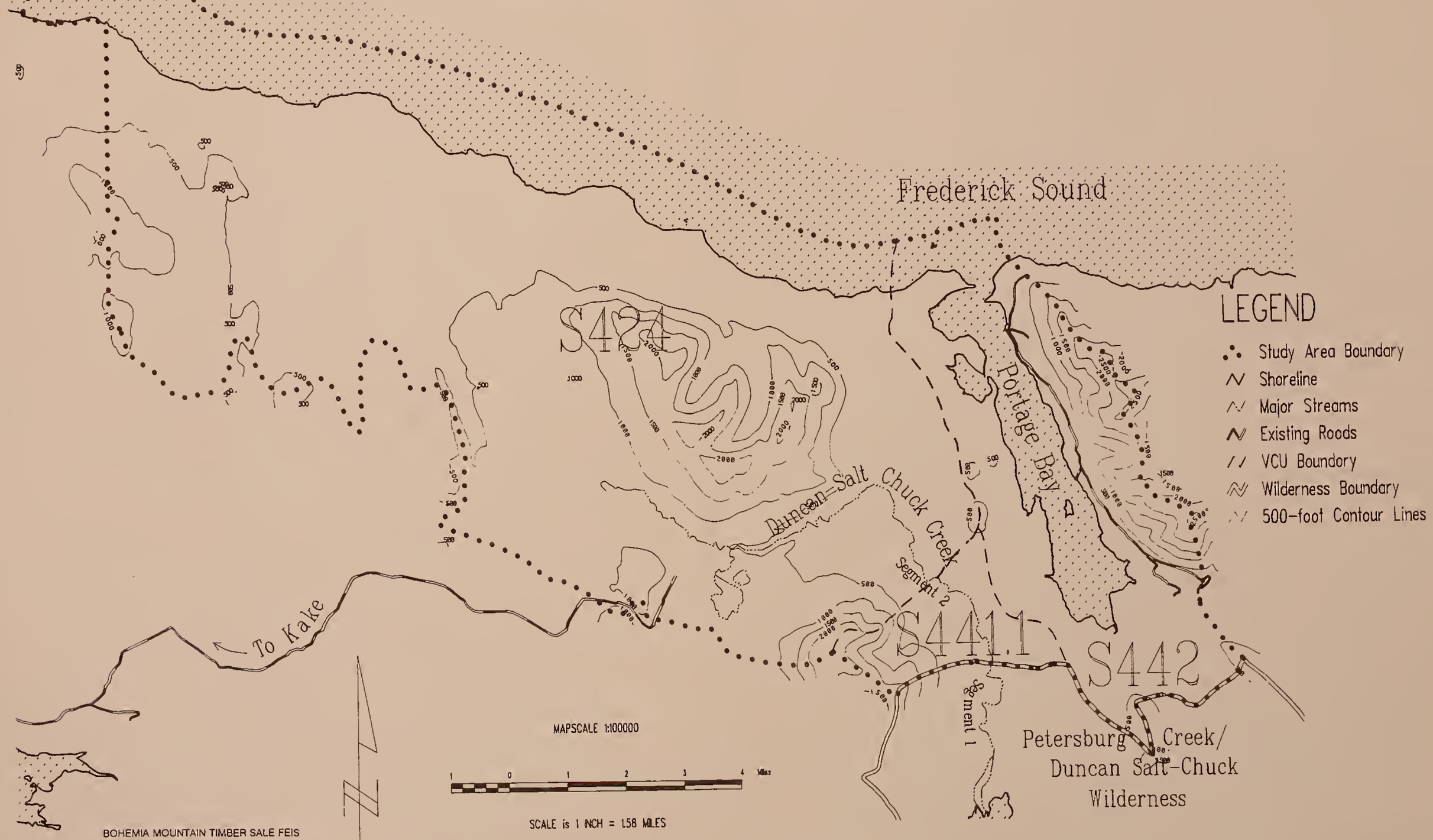
III. AFFECTED ENVIRONMENT

Maps

Tables and Figures

Purpose and Need

Map 1-1. Bohemia Mountain Analysis Area



Chapter 1

Purpose and Need

Purpose and Need

Purpose and Need of the Project

The purpose of this project is to make between 10 and 40 MMBF of timber available for harvest as part of the Stikine Area independent sale program in the Bohemia Mountain area on north Kupreanof Island and also to determine the suitability of Duncan Salt Chuck Creek for possible inclusion in the Wild and Scenic River System. The need is to supply timber volume from the Tongass National Forest to dependent industry in an environmentally sensitive manner consistent with current Forest Plan land use designation. This Final Environmental Impact Statement (EIS) is tiered to the Tongass Land Management Plan (TLMP), amended in the winter 1985-1986. The analysis area is located on the Petersburg Ranger District of the Stikine Area, Tongass National Forest. The analysis area is located in all or portions of Management Areas S10 and S14; containing value comparison units (VCU's) S424, S441.1, and S442; has been allocated in the current Forest Plan to Land Use Designations (LUD's) II and IV, and contains approximately 67,689 acres. VCU 441.1 was originally considered by Congress for Wilderness designation during consideration of ANILCA. The Congress decided not to include these lands in the National Preservation System, thus directing their release from LUD I status. The allocation of this LUD was determined and it is now managed as a LUD II area. The Bohemia Mountain analysis area (see Map 1-1) was selected and scheduled in the current Forest Plan for a timber sale for several reasons:

1. The area is allocated primarily to LUD IV in the Forest Plan which emphasizes commodity uses allowing timber harvest. A small portion of the area is allocated to LUD II, which emphasizes management in a roadless state to retain their wildland character. Roads are not allowed in LUD II except for authorized activities such as wildlife and fish habitat improvement projects, timber harvesting to control insect infestations, and to provide for vital Forest Service transportation links (TLMP, p. 8-9).

2. Current inventories indicate there is sufficient timber volume in the area which can be harvested at this time to help meet industry needs in the independent timber sale program.

3. A considerable effort has been made to collect data for previous projects in this and the surrounding area; this data is available for the area.

4. There may be an opportunity to complete construction of Forest Road 6030 between Kake and Portage Bay to benefit other resources and administrative uses.

5. Existing log transfer facilities (LTF's) and existing logging camps will likely be used. However, due to the distance from Kake, a logging camp will be considered for the Bohemia side of the analysis area. Additionally, a floating logging camp may be provided in Portage Bay.

6. Other roaded portions of Kupreanof Island are being studied for sales or have ongoing sales and are therefore not available for a 1992 or 1993 sale offering.

7. A sale in this area would be responsive to Congressional direction in the Tongass Timber Reform Act and other legislation to meet market demands for timber products. The timber demand is currently high in southeast Alaska and this sale would provide opportunities to make timber available to help meet this market demand.

8. The area can likely be developed without having significant effects on other roadless portions of Kupreanof Island.

Purpose of the Environmental Impact Statement

The purpose of this document is to describe alternative approaches, developed from public scoping, for harvesting timber in the Bohemia Mountain area. It describes the environment that would be affected by the project, discloses the significant environmental consequences of each alternative, and responds to the issues identified in the public scoping process, including management concerns.

Varying segments of Duncan Salt Chuck Creek were studied, and included in this analysis is a range of alternative classifications for these segments, including the choice of no classification (see Appendix E). The various effects of designating versus not designating the river are disclosed, along with expected short- and long-term environmental consequences.

Decisions to be Made

The environmental impacts documented in this Draft Environmental Impact Statement provide the basis for the following decisions to be made by the Stikine Area Forest Supervisor in the Record of Decision (ROD):

a. Will any part of Duncan Salt Chuck Creek be recommended for inclusion into the Wild and Scenic River System?

b. If any part of Duncan Salt Chuck Creek is recommended for inclusion in the Wild and Scenic River System, which classification, or combination of classifications, will be recommended--"wild", "scenic", or "recreation"?

c. Will a timber sale and associated roads be offered in the planning area at this time?

d. If timber harvest and road construction do take place, how much in the given 10 to 40 million board feet (MMBF) range will actually occur; where will the harvest units and roads be located; which log transfer facility(s) will be used; and where will the camp and sort yard be located?

e. If the timber harvest and road construction are to occur, what special measures, in addition to the normal standards and guidelines, might be needed to protect fish, wildlife, recreation, and visual resource values?

f. Will a road connection be made between Kake and Portage Bay at this time?

Background

Resource inventories were completed in 1980 for much of the Bohemia Mountain area, the current analysis area, but the project was dropped from further study at that time due to poor market conditions and the lack of demand for timber sales in 1980. In 1982, an Environmental Assessment for the Bohemia study area was completed, which designed a sale to harvest 24.1 MMBF in 18 clearcut units and construct 28.9 miles of road. This sale never sold, due to poor market conditions at the time, but the mainline road, FR 6030, was constructed. The road was built ahead of the sale to improve the economics for the independent purchaser. Three units from this sale are now part of the Combination Sale currently being harvested.

The Forest Plan amendment of 1985-1986 updated Management Activity Schedules showing the Bohemia Mountain Timber Sale. The timber market in southeast Alaska began to improve, and the Bohemia Mountain sale was listed as a possible project to be offered for sale in 1992. Since the proposal includes unroaded areas, the Forest Service determined that an Environmental Impact Statement would be prepared.

The Tongass Land Management Plan is currently being revised. The Revision Draft EIS evaluated rivers on the Tongass National Forest and found 112 rivers tentatively eligible for further consideration as potential additions to the National Wild and Scenic River System. Duncan Salt Chuck Creek is one that was eligible, though it was not recommended in the Regional Forester's preferred alternative in the Forest Plan Revision Draft EIS. The status of the stream could affect the location and design of the timber sale. Since the Revision may not be completed until 1992, it has been determined that the decision on whether to recommend the river needs to coincide with the decision on the timber sale.

As a result, this EIS includes a study of the suitability of Duncan Salt Chuck Creek for inclusion in the Wild and Scenic River System. The study was done using the same process and with the same level of detail that would have been used had it been completed through the TLMP Revision process.

Additional Guidance

This Final Environmental Impact Statement (Final EIS) is based on a systematic interdisciplinary analysis conducted in consultation with Alaska and other Federal agencies, the Organized Village of Kake (OVK), and other interested parties.

The Final EIS is tiered to the current Forest Plan and the Forest Service's Alaska Regional Guide (November 1983). Tiering means that the Draft EIS will follow guidance provided in the current Forest Plan and Regional Guide; relevant portions of these documents, and others, have been incorporated into the Draft EIS by reference.

Broad direction for Forest Service planning and management is provided by many laws including, but not limited to, the Organic Act of 1901, Multiple-Use Sustained-Yield Act of 1960, Resource Planning Act (RPA) of 1974, and the National Forest Management Act (NFMA) of 1976, which amended RPA.

The Organic Act and Multiple-Use Sustained Yield Act provide direction on resource management. NFMA provides direction for planning management of National Forest lands and resources. RPA requires periodic review and setting of National and Regional targets and outputs for both short-term and long-term planning. RPA is reviewed every five years and formally updated every 10-15 years. Within the framework of NFMA and RPA, management direction is provided for a Forest Service Region by a Regional Guide. A Regional Guide for Alaska was finalized in November 1983.

1 Purpose and Need

The Tongass Land Management Plan (TLMP), approved in 1979, designated various parts of the Forest for different mixes of resource use. The Forest was divided into 847 value comparison units (VCU's), each consisting of a major watershed or group of minor watersheds. The degree of development and related resource protection allowed was indicated by assigning a land use designation (LUD) to each of the VCU's. Designations range from LUD I, wilderness management, to LUD IV, emphasizing maximum resource development with appropriate environmental constraints.

Analysis Process

Forest Service specialists described the proposed project to the public, State, and other Federal agencies beginning with public notice in April 1989. Additional scoping letters, a newspaper article, and personal contacts were made to identify public issues associated with the proposed project. These issues are used to develop the alternatives and track whether or not they are being addressed throughout the analysis.

The available resource data for the Bohemia Mountain analysis area was entered into a geographic information system (GIS) to display the spatial arrangement of resource information and associated attributes (computer mapping). Resource data entered into the GIS included sensitive stream buffers, various types of wildlife habitat, sensitive visual resources, timber and soil inventories, and roads. Data was used to develop a harvest system map where the harvest settings suitable to the timber and terrain were identified. This information was then used to analyze the consequences or effects of each alternative and help identify the alternative preferred by the Forest Service. For each of the units in the proposed timber sale, mitigation measures have been identified. Mitigation measures are specific measures required for each unit. They are based on each specialist's review of photos showing proposed unit locations and on their knowledge of the area. Some minor changes in unit location are unavoidable due to undetectable ground conditions that will affect road, setting, and boundary location. When field layout requires special mitigation measures, the responsible specialist will be consulted and involved in layout if necessary. They also identify opportunities for resource enhancement and the public's use and enjoyment of the area. Inventories, reports, and other pertinent documents are part of the Bohemia Mountain planning record and are available for public inspection at the Stikine Area Supervisor's Office in Petersburg, Alaska.

Bohemia Mountain with Portage Bay and Dry Bay in foreground

Issues

The first public notice of the project appeared in April 1989. Four State agencies (Alaska Department of Fish and Game, Alaska Department of Governmental Coordination, Alaska Department of Natural Resources, and Alaska Department of Environmental Conservation), nineteen local, municipal, and state organizations, three Federal agencies (National Marine Fisheries Service, U.S. Fish and Wildlife, and U.S. EPA- Alaska Operations Office), and at least seven individuals were contacted by the interdisciplinary team (IDT) during the scoping process. A Notice of Intent to Prepare an EIS was published in the Federal Register on January 22, 1990. Responses were received from three organizations (Narrows Conservation Coalition, Heritage North, and the City of Kupreanof) and seven individuals. A Revised Notice of Intent was signed by the Forest Supervisor on April 16, 1991, when it was decided to include the wild and scenic river suitability study of Duncan Salt Chuck Creek in this project.

The public comments from the initial 1989 scoping of this project were reviewed and an updated scoping document was developed and mailed to interested parties on March 7, 1990. The IDT then designed alternatives to address, to varying degrees, the following issues:

1. **Potential impacts of timber harvest and road construction on maintaining sufficient wildlife habitat for black bear, deer, eagles, furbearers, grouse, and waterfowl. (Issue raised by the Alaska Department of Fish and Game)**

   Management Indicator Species (MIS's) have been identified to reflect the wide variety of wildlife species indigenous to southeast Alaska. Responsiveness to the wildlife habitat issue was evaluated by comparing the amount of habitat for these species that would be disturbed. Computer models were used to analyze needs of Sitka black-tailed deer, pine marten, black bear, river otter, and bald eagles.

2. **Potential impact on water quality and downstream anadromous fish habitat due to timber harvest and road construction. (Issue raised by Southeast Alaska Seiners, Alaska Department of Fish and Game, and several individuals)**

   Indicators to watch related to this issue are the miles of fish streams that would have timber harvest close enough to require minimum 100 foot streamside buffers and the number of road crossings on fish streams.

3. **Potential impact of timber harvest and increased road access on subsistence resources and users. (Issue raised by Southeast Alaska Conservation Council and several individuals)**

   a. How will the Forest Service manage the improved access created by roads so as not to significantly increase competition for subsistence resources by subsistence users?

   b. How will the Forest Service maintain sufficient habitat and conditions for subsistence resources so as not to significantly restrict those users or resources?

Issues (cont.)

Analysis focused on evaluating the Tongass Resource Use Cooperative Survey (TRUCS) data and fish and game harvest levels to determine if there is a possibility that management activities would result in a significant restriction of subsistence uses.

4. **Ability to produce an economically viable timber sale while adequately protecting other resources. (issue raised by several individuals)**

   Analysis focused on meeting the mid-market test for profitability to business, and on return to the government. Harvest units were designed by an interdisciplinary team of resource specialists to minimize the impacts on other resources.

5. **Extending Forest Road 6030 to connect Kake and Portage Bay. (issue raised by several individuals)**

   From a Forest management standpoint this road connection will significantly improve economics, management flexibility, and safety. Some residents of the Petersburg, Kake and Kupreanof communities, however, believe that this connection may have serious impacts. Two issues are involved:

   a. The proposed road location crosses a portion of LUD II land. These lands are to be managed in a roadless state to retain their wildland character but allow access roads to cross in some cases where necessary to allow access to lands on either side of the LUD II area. The LUD II area in question is a remnant of a larger area, most of which was included in the Petersburg Creek-Duncan Salt Chuck Wilderness.

   b. While the decision to build a Kake-to-Petersburg connection is outside the scope of this project, it is an associated issue that is recognized. If the Kake/Portage Bay road is constructed, it would link existing roads to within 12 miles of Petersburg, possibly generating support for a state decision to build the remaining portion.

   Analysis focused on the proposed and existing road network and LTF's at Portage Bay and Hamilton Bay, and the potential need to connect the community of Kake and the Portage Bay Logging Camp and those existing road networks, while at the same time developing a transportation network in an unroaded area.

6. **Potential impact of road construction on the Petersburg Creek-Duncan Salt Chuck Wilderness and its associated values. (issue raised by Southeast Alaska Conservation Council and several individuals)**

   Specific concerns are that increased access may cause use to exceed carrying capacity; additionally, the visibility of the road and associated rock pits and sound from traffic may reduce the quality of the wilderness experience.

   Analysis focused on locating and designing roads and rock pits that minimize impacts to wilderness. For example, the Kake to Portage road connection may not be built.

Issues (cont.)

7. **Potential impacts of timber harvest, road construction, and rock pit development on the landscape's visual character as seen from ferry boats and small recreational boats on Frederick Sound and Portage Bay. (Issue raised by several individuals)**

   Specific concerns include which areas are seen and for what duration. Frederick Sound and Portage Bay are highly sensitive travel routes where landscapes are viewed frequently and for long duration. Harvest activities associated with the Portage-Twelvemile Timber Sale, Todahl Timber Sale, and activities on nearby Native lands are likely to affect the viewers' sensitivity toward management activities located in visible portions of the Bohemia Mountain analysis area.

   Visual quality objectives (VQO's) were used to evaluate visual quality. Factors to be considered include visibility, visual variety in the area, and the ability of the area to absorb and mask management activities.

8. **Consideration of Duncan Salt Chuck Creek as suitable for designation to the Wild and Scenic River System. (Issue raised by American Rivers and several individuals)**

   This river was identified as a possible candidate for any of the three classifications during the comprehensive inventory conducted for the Forest Plan Revision.

   Analysis focused on completing a suitability study report to determine whether or not Duncan Salt Chuck Creek is suitable for possible inclusion in the National Wild and Scenic River System and evaluate the resource tradeoffs.

Opportunities

The IDT identified eight other resource opportunities:

1. To provide additional timber supply to the local timber industry to support a part of the local economy.
2. To identify fish, wildlife, recreation, and other project enhancement opportunities which would become more feasible because of the timber sale.
3. To increase production of wood fiber on harvested portions of land by converting older-aged stands to young, vigorous second growth stands.
4. To connect Portage Bay logging camp to Kake by road.
5. To modify the barrier on Duncan Salt Chuck Creek to allow salmon to spawn upstream.
6. To provide road access to Wilderness trailheads; creating a unique recreation opportunity in southeast Alaska.
7. To enhance Portage Mountain Loop trail.
8. Possibly to construct a wildlife viewing area in Portage Bay (for a variety of wildlife species).

Approvals Required From Other Agencies

A number of agencies have provided, or will provide, information for this EIS, including the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, and the Alaska Department of Natural Resources. The Forest Service also consulted with the Alaska Department of Governmental Coordination to ensure the project was consistent with the Alaska Coastal Zone Management Plan.

As the lead agency for this environmental compliance action, the Forest Service is responsible for the preparation of the EIS. The Forest Service will make decisions based on the EIS, to be documented in the Record of Decision (ROD). The Forest Service has acquired permits from the U.S. Army Corps of Engineers and the Alaska Department of Environmental Conservation. The following permits are on file at the Stikine Area Supervisor's Office:

U.S. Army Corps of Engineers
A single permit from the Corps incorporates requirements for the Clean Water Act and the Rivers and Harbors Act. It also includes U.S. Environmental Protection Agency permits for pollution discharge elimination and spill prevention control and countermeasure. In addition, the Corps permit covers the Alaska Department of Environmental Conservation certificate of reasonable assurance for compliance with Alaska water quality standards. This permit has already been issued for the Little Hamilton log transfer facility in 1982, and the Portage Bay log transfer facility in 1985.

State of Alaska Division of Governmental Coordination (ADGC)
A review coordinated by ADGC determines whether the State agencies agree with the Forest Service determination of consistency with the Alaska Coastal Zone Management Plan.

The permit for both log transfer facilities that may potentially be used for the Bohemia Mountain Timber Sale has already been obtained, along with the State tidelands easement for the use of State tidelands. The Little Hamilton Bay permit expires in 2017 and the Portage Bay log transfer facility permit expires in 2010.

Department of Environmental Conservation
If a new camp is considered, such as a floating camp, rather than using existing camps, the Forest Service will work with DEC to acquire the necessary permits for water, solid waste discharge, and sewer discharge.

Clearing Road After Blast

Log Dump

Chapter 2

Chapter 2

Alternatives

Introduction

This chapter describes alternative methods of providing short-term timber sales for the independent timber industry in southeast Alaska. The project is known as the Bohemia Mountain Timber Sale.

Process Used to Formulate Alternatives

When planning a timber sale, a group of specialists, known as an interdisciplinary team (IDT or ID team) meets and discusses how best to accomplish the goal described in the "Purpose and Need" section of Chapter 1. They design alternatives around themes that provide different approaches to responding to issues. Where one approach might emphasize high volume harvest, another might emphasize maintaining visual quality of an area. The National Environmental Policy Act (NEPA) regulations (40 CFR 1502) mandate consideration of all reasonable alternatives to a proposed action, including identification and discussion of alternatives eliminated from detailed study.

When planning the alternatives, the ID team first identifies major issues through public involvement efforts, called *scoping*. For each of these issues, the team comes up with a set of strategies that could be used to resolve that issue. The team also identifies indicators to watch as a means of measuring or comparing how each alternative responds to the issue.

Potential harvest units and the roads needed to gain access to those units are developed. The source of information for this process is the computer-based resource inventory. From this inventory, it is possible to produce maps that display all of the areas where we would not consider timber harvest due to stream buffer, over-steepened soils, eagle nests, and other resource concerns.

Next, the ID team develops themes for the "action" alternatives (those where some land disturbing activities would be taking place.) The team matches issues with themes in each alternative, and works to come up with appropriate units to best fit these themes.

For this project, five timber harvest alternatives and a "no action" alternative were developed to respond, in varying degrees, to the issues described in Chapter 1. All of the action alternatives were constructed through the IDT process to achieve multiple resource objectives within the scope of the project analysis.

Design Elements Common to All Action Alternatives

Some of the major design elements common to all action alternatives follow (these do not apply to Alternative 1, the "no action" alternative):

Standard Elements

Riparian Buffers. As required by the Tongass Timber Reform Act, a buffer zone of no less than one hundred feet in width on each side of all Class I streams and on those Class II streams which flow directly into Class I streams is prescribed in all action alternatives for harvest units near such streams.

Roads and Rock Pits. Some roads on the east and north slopes of Bohemia Mountain would be visible for short stretches but would produce relatively low visual impacts. New roads in Portage Bay would have little or no visual impact. In sensitive viewsheds such as ferry routes, rock pits would be placed outside of harvest units and screened by trees as much as possible.

Log Transfer Facility (LTF). Alternative 3 would use the existing Portage Bay log transfer facility (LTF) and Alternative 4 would use the Little Hamilton LTF for the dumping of all roaded timber harvest volume. Alternatives 2, 5, and 5A would use both facilities for roaded timber harvest volume.

Logging Camps. Alternative 3 would use the existing Portage Bay logging camp site. Alternative 4 would use the Kake logging camp site. Alternatives 2, 5, and 5A would use both logging camp sites.

Helicopter Logging. Helicopter logging was included in the design of each of the action alternatives, except Alternative 4, to provide the opportunity to harvest without further fragmenting the area with roads. To provide an economically feasible helicopter portion of the sale, approximately 134 acres would be harvested in two units totalling about 6.0 million board feet (MMBF).

Helicopter-yarded volume will be yarded directly to constructed or existing roaded landings. Some landings would have to be enlarged to facilitate log handling.

Helicopter units are the same in all of the action alternatives, even though their unit numbers are different.

Soils. Harvest units and roads have been relocated to avoid high-hazard soil locations.

New Perspective Elements

The Bohemia Mountain timber sale will implement New Perspectives concepts. Below are the New Perspective concepts that were used as design elements common to all timber harvest alternatives.

Internal Exclusions. Whenever possible, some trees within the harvest unit would be left purposely to achieve structural diversity and to modify blocky unit shapes. These are silviculturally referred to as "leave trees" for green tree deferral.

Maintenance of Older-Aged Forest Blocks. One of the major analyses undertaken was to evaluate older-aged stand conditions and patterns over the entire 67,689-acre analysis area. Most of the timber stands in the area are more than 200 years old. Most of the existing managed stands are less than 10 years old and the oldest managed stands are approximately 75 years old. All the alternatives incorporate to varying degrees the concept of minimizing entry into large, interconnected blocks of older-aged habitat. Alternatives 1 and 3 maintain four blocks, ranging in size from 862 to 6,713 acres. Alternatives 2, 4, 5, and 5A maintain three blocks ranging in size from 862 to 6,713 acres (see Table 4-13 and Map 3-7). This would offer a wider range of landscape management options in the future.

Public Input and Participation. Another component of New Perspectives is public input and participation. The Bohemia Mountain analysis effort used some non-traditional methods to seek public input, including intensive public scoping and taking representatives from outside agencies and interest groups to the analysis area and explaining possible alternatives at the site.

Maintenance of High Value Wildlife Habitat within Beach Fringe, Riparian, and Estuarine Areas. Wildlife resource inventory maps were generated using Habitat Capability computer models to evaluate habitat quality, size, and juxtaposition throughout the analysis area. The highest quality overall wildlife habitat was identified by generating a mean wildlife Habitat Suitability Index (HSI)* using the individual HSI values of the five project management indicator species: bald eagle, Sitka black-tailed deer, black bear, marten, and river otter. All areas with an average HSI of 0.7 or greater were removed from consideration during this project analysis. In general, this area consisted of most habitats occurring within 500 feet of the beach and 1,000 feet of estuarine areas, as well as some selected high quality riparian areas. Avoidance of these habitats in all alternatives resulted in a continuous corridor of high quality habitat extending along the beach fringe throughout the analysis area.

**HSI* is further defined in the glossary and on page 3-15.

Range of Alternatives

The range of alternatives, as a whole, addresses the issues identified in Chapter 1. Each action alternative is consistent with the Land Use Designations and guidelines for management direction in the current Forest Plan.

The volume of timber to be harvested ranges from 12.2 million board feet (MMBF) to 38.2 MMBF, while the "no-action" alternative describes the effects of choosing not to conduct a timber harvest. All of the proposed action alternatives, except Alternative 4, would harvest 6.0 MMBF with a helicopter yarding system. The number and shape of helicopter units is the same for alternatives 2, 3, 5 and 5A.

The alternatives were developed and designed using "adjusted" operable commercial forest land (CFL). This designation does not allow timber harvesting on areas with a habitat suitability index of .7 or greater or areas with high hazard soils. Map 3-14 shows the total CFL in the analysis area (25,840 acres). The commercial forest land includes approximately 2,970 acres of inoperable CFL which is not available for harvest. Of the approximately 22,870 acres of operable CFL suitable for harvest, 9,131 acres (40% of the operable CFL) were identified from field surveys and habitat modeling to be .7 HSI or greater.

The first step was identifying CFL (land that can produce at least 8,000 board feet of timber per acre in 100 years). To minimize landslides, all the inventoried high hazard soil areas were initially removed from this base. The interdisciplinary team (IDT) then developed a multi-entry layout plan for harvesting the remaining inventoried CFL.

Field reconnaissance and additional photo interpretation showed that some of the timber identified in this layout plan was on the border of being non-commercial (less than 8,000 board feet per acre). When feasible, areas of muskeg were removed from the timber stand data base in an attempt to calculate accurate volume and acreage figures. Additional field verification was done during the 1991 field season, before completion of the Final Environmental Impact Statement (EIS), resulting in further refining of the alternatives. Unit boundaries shifted, some settings were dropped, and in some cases whole units were dropped from the alternatives to mitigate soil, water and other resource concerns.

As stated earlier, the operable CFL was further "adjusted" by removing all timber within 500 feet of the beach and 1,000 feet of estuaries (.7 and greater HSI values). No timber harvest activities would be proposed in these areas in order to protect most high value wildlife habitat (HSI .7 or greater). All harvest proposals have been developed using the adjusted operable CFL.

Alternatives Considered but Eliminated from Detailed Study

The Forest Service considered a range of alternatives in order to identify a reasonable set of alternatives to be studied in detail. One that was eliminated from detailed study, along with the rationale for its dismissal, follows:

Two LTF's

A preliminary analysis of the proposed Bohemia Mountain Timber Sale indicated substantial log haul cost savings by developing the transportation system to include a new log transfer facility (LTF) on the west side of Portage Bay. Subsequent environmental analysis pointed out that the cumulative impacts from two LTF's in this relatively small, shallow bay would not be acceptable. This alternative was therefore eliminated from detailed study.

Alternatives Considered in Detail

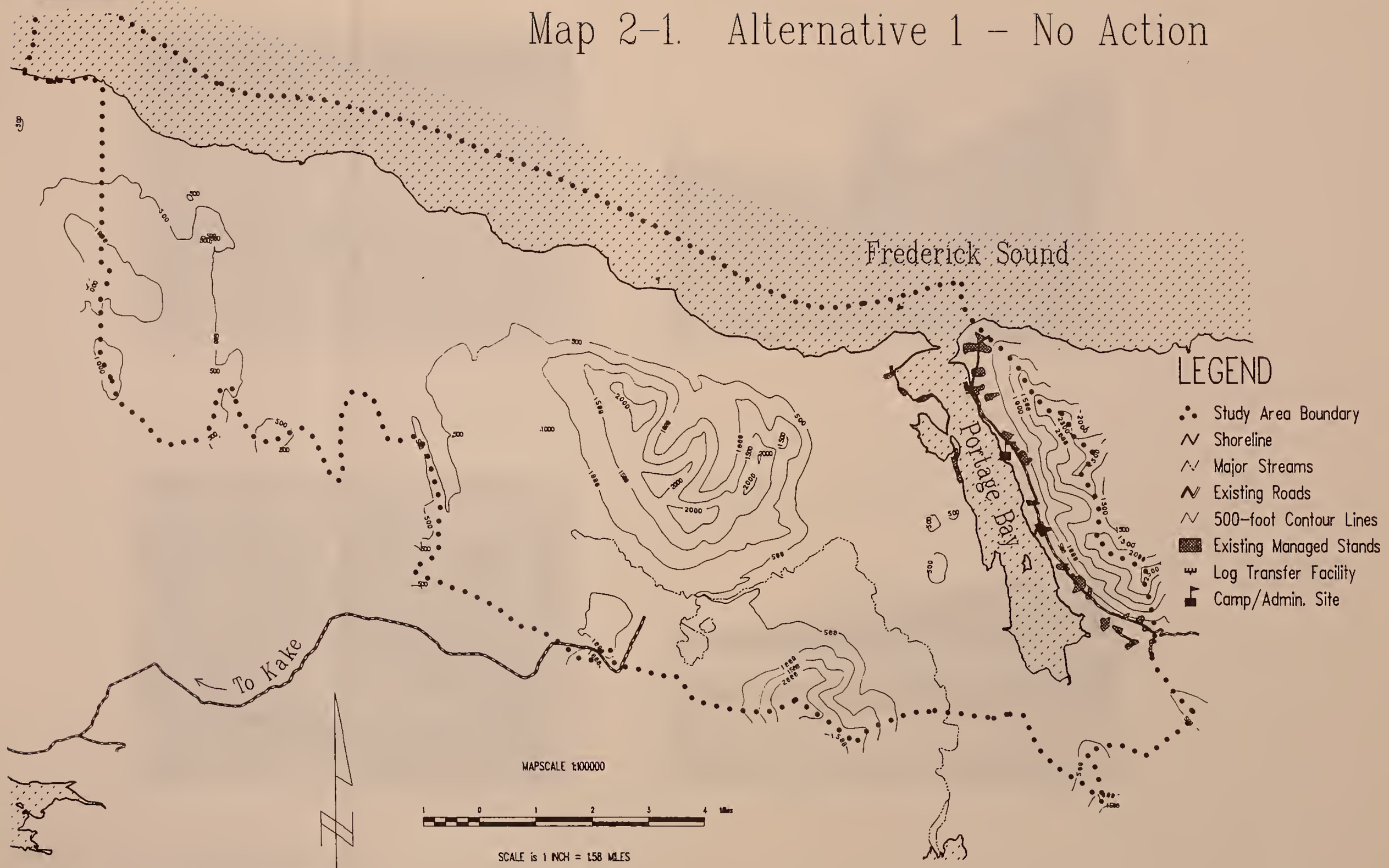
The Forest Service developed five action alternatives and one "no action" alternative for detailed analysis. Each of these alternatives provides protection for resources; each responds to resource management opportunities such as timber harvest, wildlife habitat management, and visual resource management; and each addresses issues the public and Forest Service identified in Chapter 1. However, each alternative provides a different mix of resource outputs that emphasizes different resource values.

Spur roads are not displayed on Maps 2-2 through 2-5A because their locations may change, with Forest Service approval, according to operator needs and equipment requirements. The spur road mileage listed is an estimate of the amount of road a prudent operator may require.

Bald Eagle Nest

Fishing from Skiff

Map 2-1. Alternative 1 - No Action



Alternative 1

ALTERNATIVE 1 (*No Action Alternative*) was designed as the "no action" alternative, in which no new timber harvest or road construction activities would occur. Management of the analysis area would continue in its current condition.

ALL LOGGING SYSTEMS
0 MMBF timber
0 harvest acres
0 miles specified road
0 miles spur road

CABLE LOGGING SYSTEMS
0 MMBF timber
0 harvest acres

SHOVEL LOGGING SYSTEMS
0 MMBF timber
0 harvest acres

HELICOPTER LOGGING SYSTEMS
0 MMBF timber
0 harvest acres

Wildlife. Alternative 1 maintains the existing wildlife habitat in its present condition.

Water and Fisheries. No new entries would be made into any watershed. One fish stream watershed would contain existing harvest units.

Subsistence. Because there would be no new access to currently unused areas, no additional competition or improved access for subsistence resources use would occur.

Timber. Alternative 1 was evaluated to assess the impact of allowing the current management in the area to continue without a timber sale, and to provide baseline information against which other alternatives were measured. Currently there is approximately 145 MMBF which could be accessed from the existing road system over the rotation.

Kake/Portage Connection. The road connection would not be built and the Kake and Portage road network systems would not be connected.

Wilderness. Alternative 1 would cause no impacts to the Petersburg Creek-Duncan Salt Chuck Wilderness.

Visual Quality. Alternative 1 would maintain the area in its present visual condition. The landscape east of Portage Bay would be allowed more time to visually recover from 1984 timber management activities, which currently meet a "partial retention" visual quality objective (VQO). The area west of Portage Bay would appear untouched by human activities.

Wild & Scenic River. Recommendation for possible inclusion in the National Wild and Scenic River System would not be made as a result of this analysis. Any recommendation would be made as part of the Forest Plan revision.

Southeast Alaska Forest

Alternative 2

ALTERNATIVE 2 provides for moderate harvest while maintaining older-aged forest blocks, meets wilderness concerns,and minimizes fragmentation.

ALL LOGGING SYSTEMS
24.0 MMBF timber
830 harvest acres
13.8 miles specified[1] road
2.6 miles spur[2] road

CABLE LOGGING SYSTEMS
17.2 MMBF timber
666 harvest acres

SHOVEL LOGGING SYSTEMS
.80 MMBF timber
30 harvest acres

HELICOPTER LOGGING SYSTEMS
6.0 MMBF timber
134 harvest acres

Wildlife. Alternative 2 would harvest 9 acres of high value (HSI .7 or greater) riparian wildlife habitat (see Map 3-8 and Table 4-10).

Water and Fisheries. Road construction under this alternative would require 34 stream crossings; 0.5 miles of stream would be buffered adjacent to harvest units.

Subsistence. Use of subsistence resources may increase as approximately 14 miles of permanent specified road would increase accessibility and might produce increased competition.

Timber. Alternative 2 would harvest six percent of the adjusted operable CFL. Map 2-2 displays the unit locations, Portage Bay LTF, and specified road system as designed. This alternative provides for moderate harvest while maintaining older-aged forest blocks and minimizing fragmentation to protect high value (HSI .7 or greater) wildlife habitat.

The helicopter logging units within this alternative are the same for alternatives 3, 5, and 5A. They consist of helicopter clearcut yarding units.

The net value per thousand board feet ($/MBF) is $-45. This net value reflects the capital investment in 13.8 miles of specified road. The capital investment for this road at this time will probably result in positive net values on future entries.

Kake/Portage Road Connection. The road connection would not be built and timber harvested on Bohemia Mountain would be hauled to Little Hamilton LTF.

Wilderness. Alternative 2 would cause no impacts to the Petersburg Creek-Duncan Salt Chuck Wilderness.

Visual Quality. Alternative 2 would visually affect the east side of Portage Bay, with minor visual impacts to Frederick Sound. Past and proposed activities east of Portage Bay would maintain an appearance of "partial retention." West of Portage Bay, proposed units would likely meet a "modification" VQO.

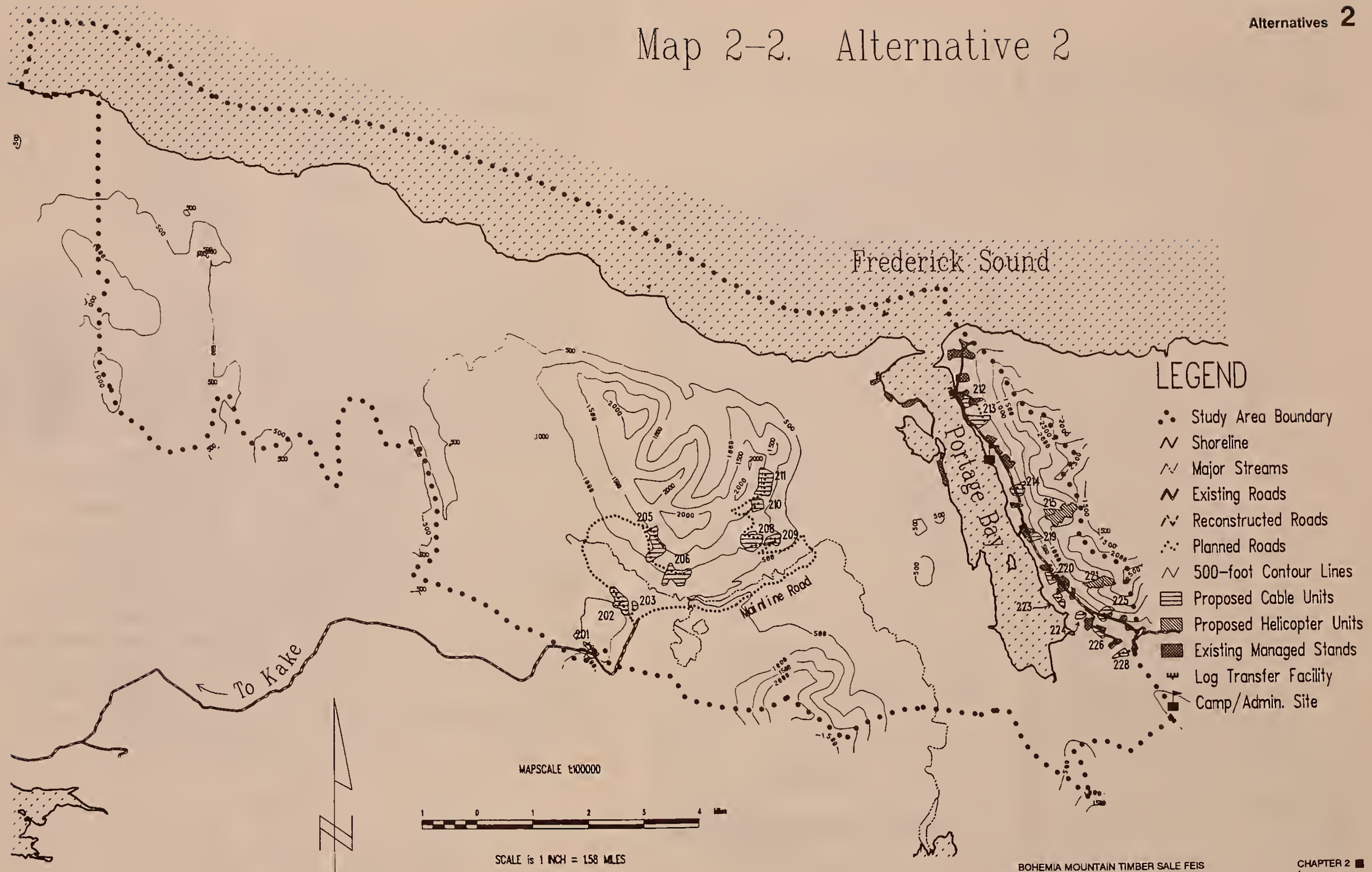
Wild & Scenic River. Alternative 2 would recommend designation of Segment 1 as a Wild River and Segment 2 as a Scenic River, which would allow a road to cross the river and reach Bohemia Mountain.

---

[1] The location of the road and the construction requirements are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

[2] Spur roads are usually less than 1/2 mile long. The location is selected by the contractor and approved by the Forest Service. Spur roads are sometimes referred to as temporary or non-system roads.

Map 2-2. Alternative 2



Map 2-3. Alternative 3

Alternative 3

ALTERNATIVE 3 was developed for two reasons: to provide a positive return to the Treasury and to maintain key wildlife habitat, since units are concentrated in Portage Bay and fragmentation is minimized. It returns money to the Treasury since it uses mostly previously constructed road.

ALL LOGGING SYSTEMS
12.2 MMBF timber
367 harvest acres
1.4 miles specified[1] road
1.1 miles spur[2] road

CABLE LOGGING SYSTEMS
5.4 MMBF timber
203 harvest acres

SHOVEL LOGGING SYSTEMS
.80 MMBF timber
30 harvest acres

HELICOPTER LOGGING SYSTEMS
6.0 MMBF timber
134 harvest acres

Bald Eagle

Wildlife. Nine acres of high value (HSI .7 or greater) riparian wildlife habitat would be harvested.

Water and Fisheries. Road construction under this alternative would require 3 new stream crossings; 0.4 miles of stream would be buffered.

Subsistence. This alternative would have little effect on subsistence resources in Portage Bay and no effect on Bohemia Mountain.

Timber. Alternative 3 would harvest three percent of the adjusted operable CFL. Map 2-3 displays the unit locations, log transfer facility, and specified road system as designed. The helicopter logging units within this alternative are the same for Alternatives 2, 5, and 5A. They consist of helicopter clearcut yarding units.

The net value per thousand board feet ($/MBF) is $32. This net value reflects the capital investment in 1.4 miles of specified road.

Kake/Portage Road Connection. The connection would not be built and Portage Bay LTF would be used.

Wilderness. Alternative 3 would cause no impacts to the Petersburg Creek-Duncan Salt Chuck Wilderness.

Visual Quality. Alternative 3 would visually affect Portage Bay. Some units may also be visible from Frederick Sound. Past and proposed activities would likely maintain an appearance of "partial retention" and would not further affect the view of persons anchored near the mouth of Portage Bay. The landscape west of Portage Bay would appear untouched by human activities.

Wild & Scenic River. No designation would be recommended under this alternative since the proposed activities do not affect the river. Analysis of the suitability of Duncan Salt Chuck Creek would occur during the Forest Plan Revision process.

---

[1] The location of the road and the construction requirements are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

[2] Spur roads are usually less than 1/2 mile long. The location is selected by the contractor and approved by the Forest Service. Spur roads are sometimes referred to as temporary or non-system roads.

Alternative 4

ALTERNATIVE 4 was designed to emphasize noncommodity benefits and maintain options for future management. No new harvest units would occur in Portage Bay, thus allowing regeneration in existing managed stands more time to mature.

ALL LOGGING SYSTEMS
20.9 MMBF timber
871 harvest acres
18.6 miles specified[1] road
3.1 miles spur[2] road

CABLE LOGGING SYSTEMS
19.6 MMBF timber
830 harvest acres

SHOVEL LOGGING SYSTEMS
1.3 MMBF timber
41 harvest acres

HELICOPTER LOGGING SYSTEMS
0 MMBF timber
0 harvest acres

Wildlife. This alternative harvests 32 acres of high value (HSI .7 or greater) riparian wildlife habitat (see Map 3-8).

Water and Fisheries. Road construction under this alternative would require 34 stream crossings; 1.98 miles of stream would be buffered adjacent to harvest units.

Subsistence. Approximately 18.6 miles of permanent specified road would provide additional access and might increase competition for subsistence resources.

Timber. Alternative 4 would harvest seven percent of the adjusted operable CFL. Map 2-4 displays the unit locations, LTF, and specified road system as designed. No helicopter units are included in this alternative.

The net value per thousand board feet ($/MBF) is $-106. This net value reflects the capital investment in 18.6 miles of specified road. The capital investment for this road at this time will probably result in positive net values on future entries.

Kake/Portage Road Connection. The connection would not be built and timber would be hauled to Little Hamilton LTF.

Wilderness. Alternative 4 would cause no impacts to the Petersburg Creek-Duncan Salt Chuck Wilderness.

Visual Quality. Alternative 4 would visually affect Portage Bay and Frederick Sound. This is the only action alternative which allows the landscape east of Portage Bay more time to visually recover before another entry. Proposed harvest west of Portage Bay would likely result in a visual condition of "modification" as seen from the bay. Five units would be seen from Frederick Sound, resulting in a visual condition of "modification."

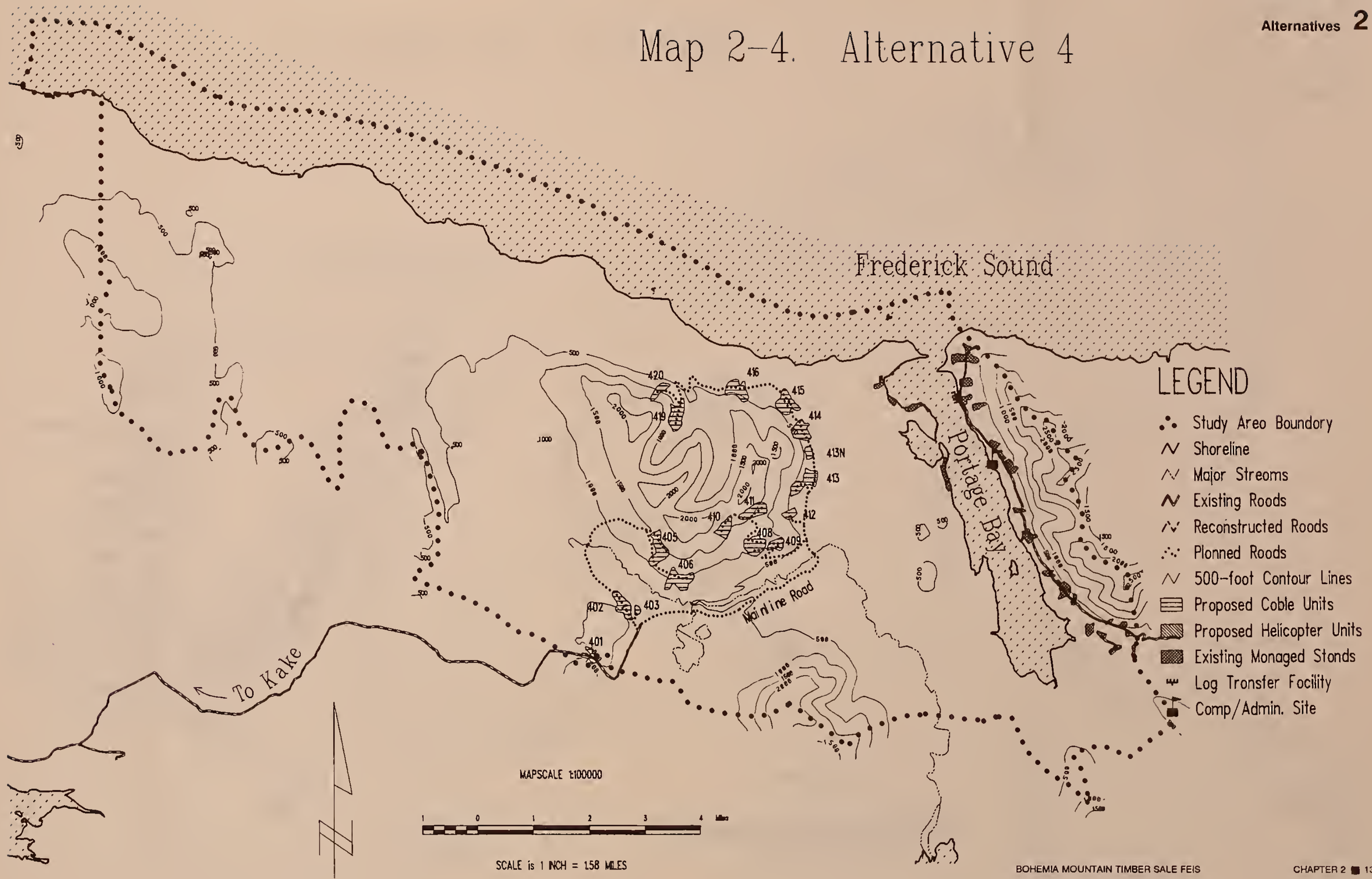
Wild & Scenic River. This alternative would not recommend Segment 2 of Duncan Salt Chuck Creek for designation. This would allow a road to cross the river. Segment 1 (within the Wilderness) would be recommended as a Wild River.

---

[1] The location of the road and the construction requirements are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

[2] Spur roads are usually less than 1/2 mile long. The location is selected by the contractor and approved by the Forest Service. Spur roads are sometimes referred to as temporary or non-system roads.

Map 2-4. Alternative 4



Map 2-5. Alternative 5

Alternative 5

ALTERNATIVE 5 was designed to harvest the most volume and build the Kake/Portage road connection. Harvest units are located on the south and east sides of Bohemia Mountain and in east Portage Bay.

ALL LOGGING SYSTEMS
38.2 MMBF timber
1416 harvest acres
28.9 miles specified[1] road
5.6 miles spur[2] road

CABLE LOGGING SYSTEMS
30.2 MMBF timber
1212 harvest acres

SHOVEL LOGGING SYSTEMS
2.0 MMBF timber
70 harvest acres

HELICOPTER LOGGING SYSTEMS
6.0 MMBF timber
134 harvest acres

Wildlife. This Alternative and Alternative 5A harvest the greatest amount of high value (HSI .7 or greater) riparian wildlife habitat, 41 acres. Road would be constructed through a high-use wildlife area at the south end of Portage Bay.

Water and Fisheries. Road construction under this alternative would require 44 stream crossings; 2.88 miles of stream would be buffered adjacent to harvest units.

Subsistence. Alternative 5 has the greatest potential to affect subsistence resources. The Kake/Portage road connection would be constructed, allowing users from Kake to reach Portage Bay via road and vice versa, thus possibly increasing use and competition.

Timber. Alternative 5 harvests the most volume and builds the greatest amount of road. The helicopter logging units in this Alternative are the same for Alternatives 2, 3, and 5A. They consist of helicopter clearcut yarding units.

The net value per thousand board feet ($/MBF) is $-74. This net value reflects the capital investment in 28.9 miles of specified road. The capital investment for this road at this time will probably result in positive net values on future entries.

Kake/Portage Road Connection. This is the only alternative that builds the connection. Both Portage Bay and Little Hamilton LTF's could be used. The shortest haul distance would be calculated and volume from Bohemia Mountain could be hauled to Portage LTF.

Wilderness. Approximately 160 acres of semi-primitive non-motorized ROS setting within the Wilderness would change to a roaded modified setting because the road and timber harvesting activities outside the wilderness would be partially audible and visible from the Wilderness. If the road connection is built, Petersburg Creek-Duncan Salt Chuck Wilderness will be the only Wilderness in southeast Alaska accessible by road and trail. This provides opportunities for a new user group.

---

[1] The location of the road and the construction requirements are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

[2] Spur roads are usually less than 1/2 mile long. The location is selected by the contractor and approved by the Forest Service. Spur roads are sometimes referred to as temporary or non-system roads.

Visual Quality. Alternative 5 would visually affect Portage Bay to a slightly greater degree than Alternatives 2, 3, or 5A. Effects of past and proposed activities east of Portage Bay would likely meet a "partial retention" VQO near the mouth and a "modification" VQO near the head of the bay. As seen from Portage Bay, activities west of the bay would likely produce a visual condition of "modification." Visual effects to Frederick Sound would likely meet a "modification" VQO.

Wild & Scenic River. Designation of Segment 1 (within the Wilderness) as a Wild River would not affect implementation of this alternative. This alternative would recommend Segment 2 (from the Wilderness boundary upstream to Bohemia Lake) for Scenic designation, which allows a bridge to cross the river and access Bohemia Mountain.

Alternative 5A

ALTERNATIVE 5A is similar to Alternative 5 but does not build the Kake/Portage road connection and harvests 4.7 MMBF less volume.

ALL LOGGING SYSTEMS
34.0 MMBF timber
1270 harvest acres
19.2 miles specified[1] road
4.4 miles spur[2] road

CABLE LOGGING SYSTEMS
26.0 MMBF timber
1066 harvest acres

SHOVEL LOGGING SYSTEMS
2.0 MMBF timber
70 harvest acres

HELICOPTER LOGGING SYSTEMS
6.0 MMBF timber
134 harvest acres

Wildlife. This Alternative and Alternative 5 harvest the greatest amount of high value (HSI .7 or greater) riparian wildlife habitat, 41 acres.

Water and Fisheries. Road construction under this alternative would require 34 stream crossings; 2.63 miles of stream would be buffered adjacent to harvest units.

Subsistence. About 19 miles of permanent specified road would be constructed, providing additional access which may increase use and competition for subsistence resources.

Timber. Alternative 5A harvests the second largest amount of volume (34.0 MMBF) and builds the second greatest amount of roads. This alternative is the same as Alternative 5 except three units west of Portage Creek are not included since the road connection is not built. The helicopter logging units in this Alternative are the same for Alternatives 2, 3, and 5. They consist of helicopter clearcut yarding units.

The net value per thousand board feet ($/MBF) is $-53. This net value reflects the capital investment in 19.2 miles of specified road. The capital investment for this road at this time will probably result in positive net values on future entries.

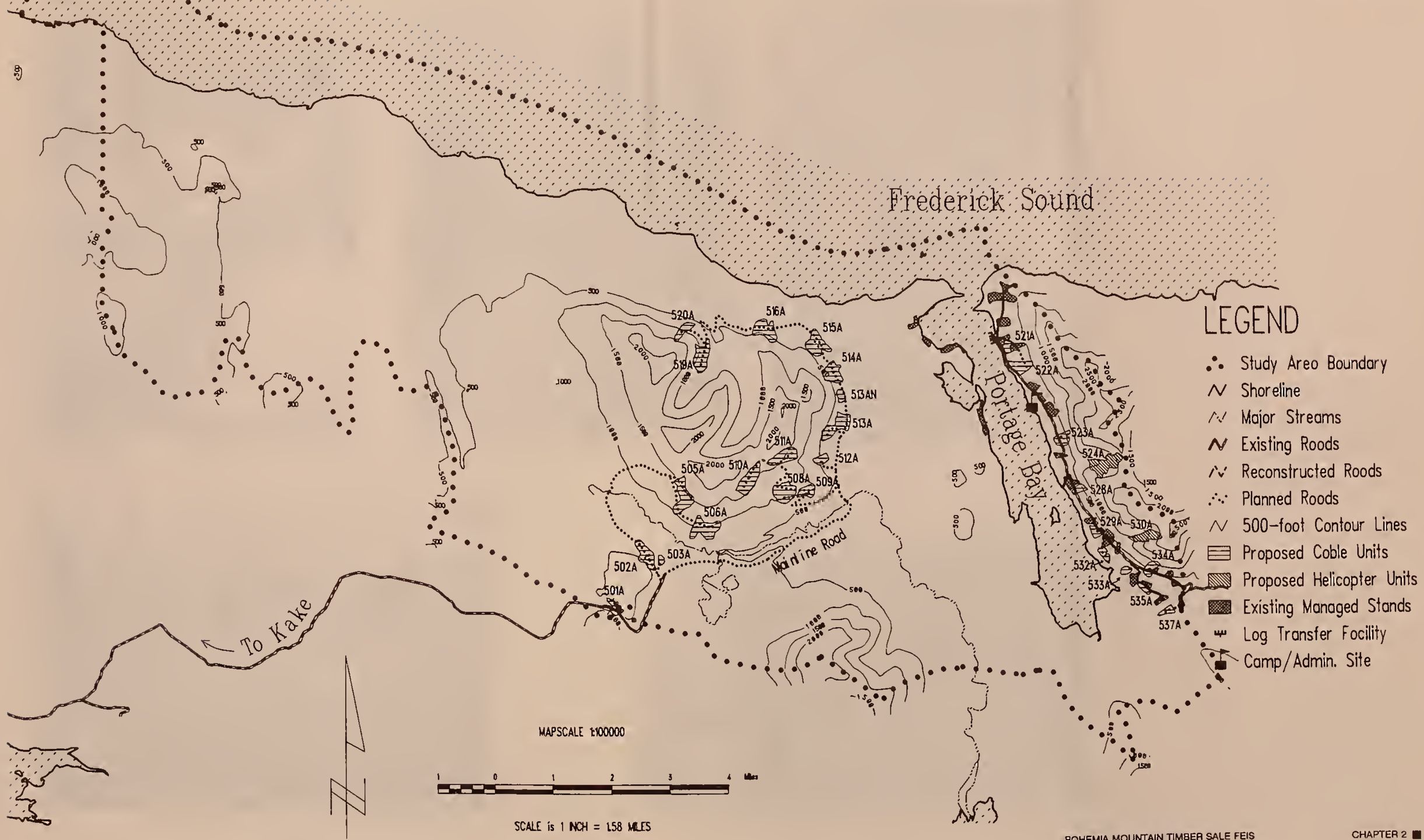
Kake/Portage Connection. The connection is not built. Both Portage Bay and Little Hamilton LTF's would be used.

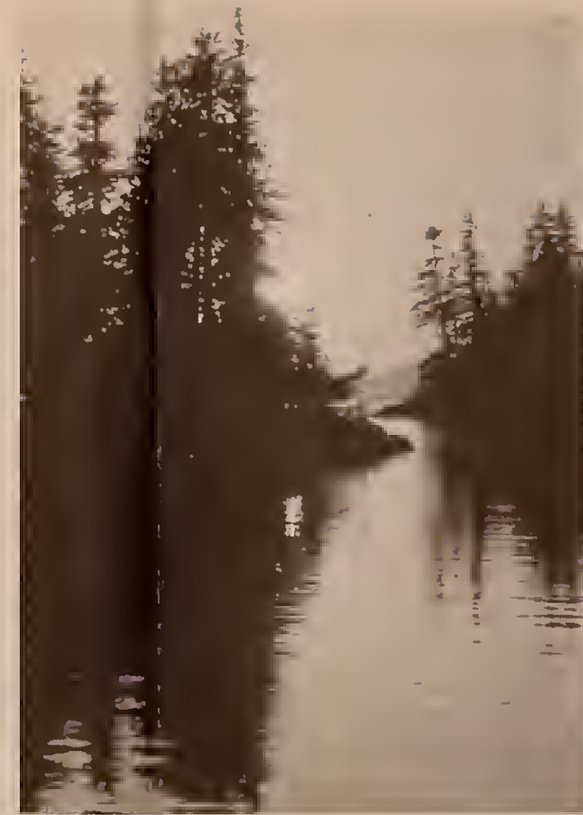
---

[1] The location of the road and the construction requirements are specified by the Forest Service. Specified roads are sometimes referred to as permanent or system roads.

[2] Spur roads are usually less than 1/2 mile long. The location is selected by the contractor and approved by the Forest Service. Spur roads are sometimes referred to as temporary or non-system roads.

Map 2-5A. Alternative 5A





Visual Quality. Alternative 5A would visually affect Portage Bay and Frederick Sound to a similar degree as Alternatives 3 and 4 combined. East of Portage Bay, past and proposed activities would likely maintain an appearance of "partial retention." West of Portage Bay, the visual condition would likely meet a "modification" VQO.

Wilderness. Alternative 5A would cause no impacts to the Petersburg Creek-Duncan Salt Chuck Wilderness.

Wild & Scenic River. Segment 1 would be recommended for designation as a Wild River. Segment 2 would be recommended for Scenic designation, which allows a bridge to cross the river and provide access to Bohemia Mountain.

Table 2-1. Comparison of Alternatives

ELEMENT OF PROPOSAL	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 5A
TIMBER HARVEST						
Total volume (MMBF)	0	24.0	12.2	20.9	38.2	34.0
Area harvested:						
Acres proposed	0	830	367	871	1416	1270
Cumulative acres	382	1212	749	1253	1798	1652
Total commercial forest land (CFL) (out of 25,840 acres)						
Percent proposed	0	3.2	1.4	3.4	5.5	4.9
Cumulative percent	1.5	4.7	2.8	4.8	7.0	6.4
Adjusted operable CFL (out of 13,739 acres)						
Percent proposed	0	6.0	2.7	6.3	10.3	9.2
Cumulative percent	2.8	8.8	5.5	9.1	13.1	12.0
Standard adjusted operable CFL (can be harvested with standard cable logging systems)						
Acres proposed	0	696	233	871	1,282	1,136
Cumulative acres	382	1,078	615	1,253	1,664	1,518
(out of 7,595 acres)						
Percent proposed	0	9.2	3.1	11.5	16.9	15.0
Cumulative percent	5.0	14.2	8.1	16.5	21.9	20.0
Non-standard adjusted operable CFL (requires helicopter)						
Acres proposed	0	134	134	0	134	134
Cumulative acres	0	134	134	0	134	134
(out of 6144 acres)						
Percent proposed	0	2.2	2.2	0	2.2	2.2
Cumulative percent	0	2.2	2.2	0	2.2	2.2
Units over 100 acres	0	0	0	0	0	0
ROAD CONSTRUCTION						
Miles of specified road construction	0	13.8	1.4	18.6	28.9	19.2
Miles of spur road construction	0	2.6	1.1	3.1	5.6	4.4
Miles of reconstruction	0	1.4	0.6	0	1.4	1.4

Table 2-1. Comparison of Alternatives (continued)

ELEMENT OF PROPOSAL	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 5A
VISUAL QUALITY						
Cumulative effects of management would be consistent with the following Visual Quality Objectives						
Seen from Frederick Sound (TLMP direction PR-M)	R	PR-M	P-R	R-M	PR-M	PR-M
Seen from Portage Bay (TLMP direction PR-MM)	PR	PR-M	PR-M	PR-M	PR-M	PR-M
P–Preservation	*PR–Partial Retention*			*MM–Maximum Modification*		
R–Retention	*M–Modification*			*(For definitions, see Glossary)*		
Visibility of proposed activities						
Percent of proposed harvest acres that would be seen from sensitive viewpoints						
Bohemia Mtn. VCU (424)	0	24	0	49	47	47
Portage Bay VCU (442)	88	91	91	0	77	91
(Note: In VCU 424, 30 percent of the total CFL is seen. In VCU 442, 80 percent of the total CFL is seen).						
Cumulative percent of seen CFL acres visually affected by past and proposed management activities						
Bohemia Mtn. VCU (424)	0	2	0	9	9	9
Portage Bay VCU (442)	10	21	21	10	23	21
(Note: Of VCU 424, 9 percent is seen CFL; of VCU 442, 28 percent is seen CFL. The numbers shown are percents of these totals; that is, past and proposed harvest with Alternative 2 would modify 21 percent of the 28 percent that is available in the Portage Bay VCU.)						
WATER QUALITY/FISH HABITAT						
Miles of buffered fish streams						
Proposed	0	0.50	0.40	1.98	2.88	2.63
Cumulative	.55	1.05	0.95	2.53	3.43	3.18
Miles of buffered fish streams proposed by VCU						
Bohemia Mtn. VCU (424)	0	0.10	0	1.98	1.98	1.98
Portage Bay VCU (442)	0	0.40	0.40	0	0.90	0.65
Miles of unbuffered streams						
Proposed	0	6.18	3.68	3.25	7.03	7.03
Cumulative	1.25	7.43	4.93	4.50	8.28	8.28
Miles of unbuffered streams proposed by VCU						
Bohemia Mtn. VCU (424)	0	2.63	0	3.25	3.35	3.35
Portage Bay VCU (442)	0	3.68	3.68	0	3.68	3.68
(Note: Unbuffered streams are Class II streams not directly feeding into Class I streams and Class III water quality streams affected by proposed harvest and road activities where AHMU prescriptions will be applied).						

Table 2-1. Comparison of Alternatives (continued)

ELEMENT OF PROPOSAL	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 5A
Number of stream crossings						
Proposed	0	34	3	34	44	34
Cumulative	24	58	27	58	68	58
Number of fish watersheds (out of 10 total) affected by alternative						
Proposed	0	4	1	4	5	5
Cumulative	1	4	1	5	5	5
Average percentage of fish stream watershed area harvested						
Proposed	0	.7	.3	1.5	2.2	1.8
Cumulative	.3	1.0	.6	1.8	2.5	2.1
WILDLIFE						
High value habitat acres harvested	0	9	9	32	41	41
Percentage of current habitat capability (see glossary) maintained	100	95	98	94	93	93
Number of large forest blocks remaining	4	3	4	3	3	3
Average size (acres)	2,708	2,839	2,679	1,598	1,559	1,559
SUBSISTENCE						
Extent of impact on subsistence use (none/minor/major/ significant)	none	minor	minor	minor	minor	minor
EMPLOYMENT						
Number of timber jobs generated	0	168	85	146	267	237
Dollar value of jobs ($million)	0	5.54	2.81	4.82	8.81	7.82
Dollar value secondary ($million)	0	38.78	19.67	33.75	61.67	54.74
ECONOMICS						
Total pond log selling value (minus 60% normal profit) $/MBF	0	239	235	244	243	241
Total costs to operator ($/MBF)	0	284	203	350	317	294
Net initial entry return ($/MBF)	0	-45	32	-106	-74	-53

Identification of the Forest Service Preferred Alternative

The Bohemia Mountain ID Team met with the Stikine Area Management Team (Forest Supervisor and staff officers) to select the alternative preferred by the Forest Service.

This area is currently designated LUD IV, which provides for commodity uses. The preferred alternative proposes to remove timber from 5 percent of the operable CFL. Over the rotation (100-120 years), all operable CFL not set aside for retention is anticipated to be harvested. Based on this removal schedule and re-entries of similar size (30-35 MMBF) every 20-30 years, harvest falls well within the rate allowed by TLMP in the study area and the effects on all resources are being spread out. After reviewing all resource impacts, consequences, and opportunities, **Alternative 5A** was identified as the preferred alternative.

Although Alternative 5A has been identified as the preferred alternative, a decision will not be made until the Record of Decison is completed. Detailed analysis demonstrates that the Forest Service has provided sufficient protection of forest resources.

Timber harvest is not given a priority over other uses. For instance, this sale will provide additional access to other areas such as a Wild and Scenic River corridor, additional recreation, and subsistence opportunities, and sites of potential fisheries and wildlife enhancement projects.

Mitigation

The following steps will be required as part of the timber sale implementation to mitigate consequences:

(a) Minimum 330-foot buffers will be maintained around eagle nest trees.

(b) The wildife maintenance areas (combined Habitat Suitability Index (HSI) .7 or greater) will be deferred from timber harvesting in all alternatives.

(c) All known or discovered cultural sites will be protected. If additional sites are discovered once the sale is in operation, protective measures will be taken under the timber sale contract provisions.

(d) Full bench road construction and removal of excess excavated material will be required on designated areas for soil stability.

(e) Pursuant to the Tongass Timber Reform Act, commercial timber harvesting within a buffer zone no less than one hundred feet in width on each side of all Class I streams and those Class II streams which flow directly into a Class I stream will be prohibited. In addition, stream protection will include provision of buffer areas and other protective actions consistent with aquatic habitat management unit (AHMU) guidelines pertaining to (1) unstable banks, (2) temperature sensitivity, (3) sedimentation, and (4) large, woody debris for rearing habitat, nutrient retention, and streambed stabilization.

(f) Class III channels will receive appropriate protection according to Best Management Practices (BMP's - see Forest Service Handbook 2509.22). See unit descriptions, Appendix F, for specific BMP's.

(g) The visual resource will be protected to the extent required to meet the visual quality objectives for the Bohemia Mountain analysis area as stated in the current Forest Plan. Landscape design principles will be used to locate and design rock pits, sort yards, and other related facilities.
(h) Rock pit and roadside rehabilitation will be implemented in areas that are heavily disturbed.
(i) Road construction impacts within LUD II lands will be kept within the approved road corridor to the extent practicable.
(j) Rock pits which must be developed within LUD II areas will be analyzed for future suitability and need for road maintenance. Those not needed will be rehabilitated according to an approved pit plan.

Monitoring

Monitoring is designed to determine if the resource management objectives of the Bohemia Mountain timber sale have been met. The results will be used to verify implementation and effectiveness of selected mitigation and protection measures in a timely manner. Three types of monitoring were recognized in the development of the monitoring plan as listed below:

Implementation Monitoring

Implementation monitoring assesses whether the project was implemented as designed and whether or not it complies with the Tongass Land Management Plan. Planning for implementation monitoring began with the design of this timber sale. Specialists used on-the-ground inventories, computer inventories, and aerial photographs to prepare documents called unit cards for each harvest unit in the timber sale. Cards were also prepared for each segment of road. Resource specialists wrote their concerns on the cards and then described how the concerns could be addressed in the design of each unit and road segment. These documents will be the basis for determining whether recommendations were implemented for various aspects of this timber sale.

Implementation monitoring is part of the administration of a timber sale contract. The sale administrators and road inspectors assure that the prescriptions contained on the unit and road cards are implemented.

Best Management Practices
Implementation monitoring of soil and water resources will largely consist of monitoring Best Management Practices (BMP's) and Aquatic Habitat Management Unit (AHMU) prescriptions. BMP's are designed to directly or indirectly protect water quality, and mitigate any adverse impacts on water quality which are associated with a land disturbing activity, such as timber harvesting, road building, and mining. For this project, monitoring will focus on timber and transportation-related activities. BMP implementation monitoring forms have been developed and are designed to be tailored to each site under consideration. BMP's to be monitored at a specific site are determined through a review of unit/road cards, fish habitat reports and other appropriate documentation.

Pre-harvest Issues of concern include land disturbing activities on high hazard soils, (BMP's 13.2, 13.5, 13.16), road and landing location (BMP's 13.10, 14.3, 14.6 through 14.10, and others), and channel stability and streamside management, including stream temperature sensitivity (BMP's 12.6, 12.7, 13.9, 13.16). BMP's are prescribed for most all units or road segments. Review the unit and road cards for the preferred alternative (found in Appendices F and G) to see how BMP's are prescribed.

Effectiveness Monitoring

Effectiveness monitoring measures the effectiveness of design features or mitigation measures. Monitoring records will be kept in the project implementation file. If an action alternative is implemented, the District Ranger is responsible for assuring the following monitoring is done:

Water Quality and Fisheries
An effectiveness monitoring program is being developed on a Forest-wide basis in consultation with the State of Alaska. Once developed, it may or may not be applied to the Bohemia sale. If the sale is not included, another area representative of Bohemia Mountain will be monitored; results will be applicable to the area.

Besides this program, monitoring on the study area will include:
What: Monitoring effectiveness of buffers on sedimentation and habitat change of Class I and II streams, and management prescriptions on sideslope disturbance on Class III streams, and of fish passage through culverts in Class I and II streams.
Where: Sites with potential or known concerns.
When: During and/or after completion of a land-disturbing activity. Culverts will be inspected for fish passage during and annually after construction.
How: Approaches include monitoring water quality and fish presence above and below the project site, before, during, and after the project occurs. Monitoring may be conducted on both test and control watersheds and streams. Current guidelines will be used in selecting parameters, sample locations, and sampling frequency.
Use: Data will be used to answer questions and address concerns raised by the Forest-wide effectiveness monitoring program. Fisheries data collected will be used to determine how well AHMU recommendations protect and maintain fisheries objectives as defined in the current Forest Plan.

Visual Quality Resource
Did visual impacts meet anticipated VQO's as viewed from Frederick Sound and Portage Bay?
What: Harvest units, rock pits, roads, and log sort yard, if any.
Where: All management activities (roads, rock pits, harvest units, etc.) seen from sensitive travel routes discussed in Chapter 3, using viewpoints established during project analysis.
When: During operations (for effects of individual units) and immediately after project is complete (for cumulative effects of entire project.)
How: Effects will be documented with photographs taken from photo points established and documented during the preparation of the environmental document.
Use: The photos will be used as reference in future planning efforts, showing what has and has not been effective mitigation for harvest units, roads, rock pits, etc., given certain ground conditions.

Soils
What: Amount and degree of soil disturbance will be monitored to determine compliance with the Forest Service Region 10 soil quality standards.
Where: Harvest units with the most potential for damage.
When: Within one year after yarding a harvest unit is completed.
How: Monitoring will be done by established transect sampling procedures.
Use: The report will be used to determine if soil quality standards are being met. If standard limits are being exceeded, harvest methods will be modified on this sale as well as other sales on similar sites.

Wildlife
What: The effectiveness of unit design in maintaining wind-firm corridors.
Where: In all areas where corridors were retained for wildlife during layout.
When: Within 5 years after the unit is harvested. Actions would be considered effective if corridors are standing 5 years post harvest.
How: Through visual observation.
Use: To determine if planned mitigation was effective.

Vegetation
What: Harvested stands will be monitored to ensure adequate restocking within 5 years following harvest.
Where: All harvest units.
When: Within 5 years following harvest.
How: In the fourth year following harvest a silviculturist will plot and sample the regeneration.
Use: Data will be analyzed and the unit will be certified or not certified as being restocked. If not restocked, efforts to this end will be implemented while monitoring.

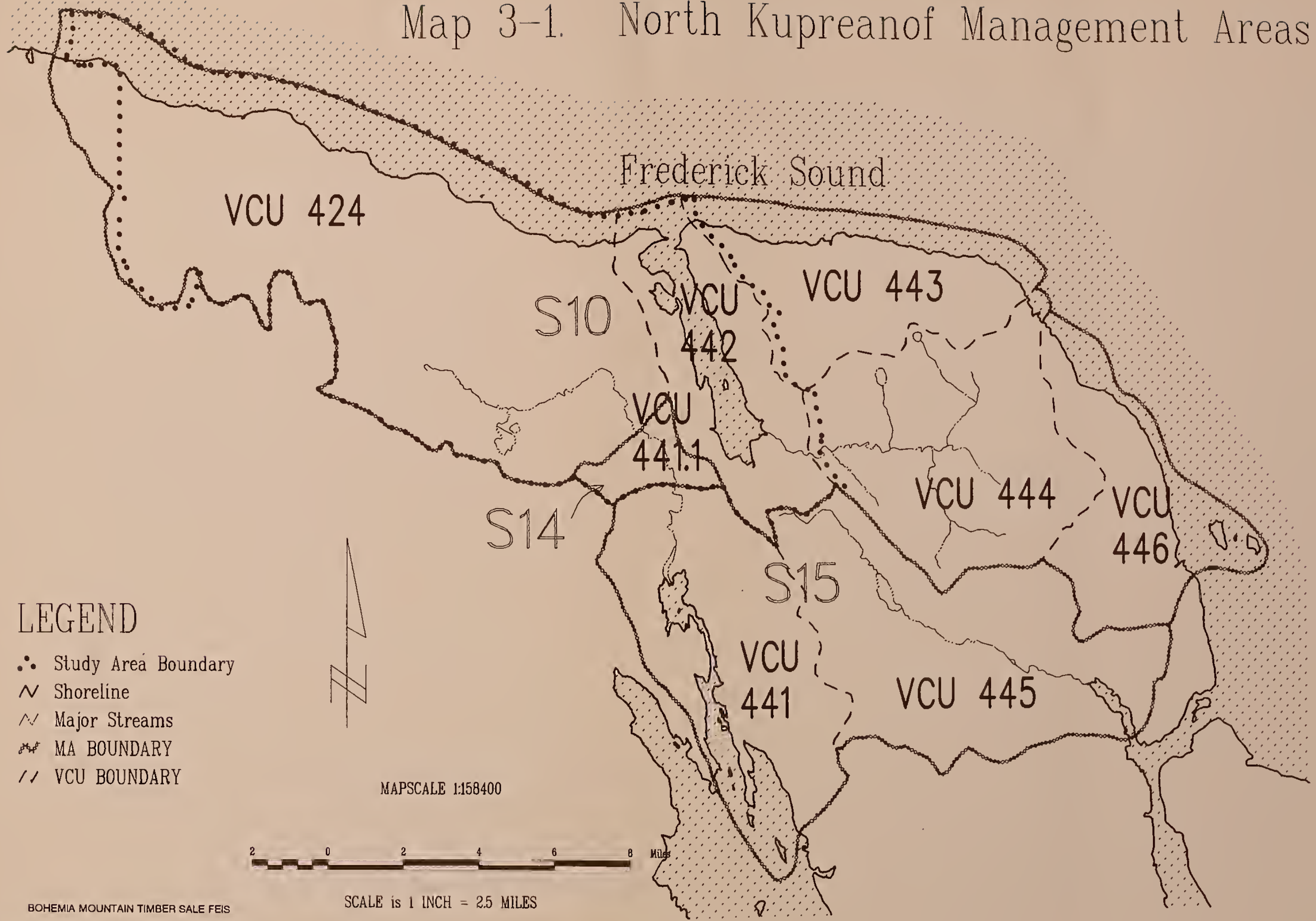
Validation Monitoring

Validation monitoring is conducted to check on the validity of resource protection standards. It is usually carried out at the regional level in conjunction with Research.

View from Portage Bay Cabin

Chapter 3

Map 3-1. North Kupreanof Management Areas



Chapter 3
Affected Environment

Introduction

This chapter describes the environment of the Bohemia Mountain analysis area. The information has been taken from more detailed reports that are available for public review in the planning record, located in the Supervisor's Office, Stikine Area, Petersburg, Alaska.

Forest Plan Guidance

The Tongass Land Management Plan (TLMP) defines land use opportunities and provides land management direction for the Tongass National Forest.

The Bohemia Mountain analysis area falls within the TLMP Portage Management Area S10 (see Map 3-1). TLMP allocated Value Comparison Units (VCU's) 424 and 442 to a land use designation (LUD) IV which emphasizes commodity uses allowing timber harvest. A small portion of the analysis area falls within Salt Chuck Creek Management Area S14. VCU 441.1 was allocated to LUD II, which emphasizes management in a roadless state, but the following activities would be allowed: wildlife and fish habitat improvement projects, roads that are vital transportation links, and timber harvesting to control insect infestations.

The Forest Plan's specific management direction and emphasis in this area is utilization of timber resources within the constraints set forth in the Regional Guide and Forest Plan. Proposed sale areas will link with the road system providing access to the community of Kake. The Kake/Portage road connection is expected to pass through VCU 441.1 if it is constructed. The transportation management objective is to connect the road system in this management area to that of the rest of Kupreanof Island if economically and environmentally feasible, and to continue to maintain the log transfer facility and logging camp in Portage Bay.

Important deer winter range will be protected, especially along the Frederick Sound shoreline. Wildlife habitat improvement projects and mitigation measures would be developed on a case-by-case basis.

Trails would be constructed from existing roads to provide access to Petersburg Creek-Duncan Salt Chuck Wilderness if consistent with the Wilderness Management Plan.

The anchorage in Portage Bay would be protected for enhancement of recreational activities, including waterfowl hunting.

Activities would be coordinated with Native lands on the west side of the management area whenever possible.

Visual quality objectives would range from "partial retention" to "maximum modification," with the higher objectives being applied on those lands viewed from the ferry lane in Frederick Sound.

For a more detailed description of TLMP and its management direction see the Tongass Land Management Plan and Tongass Land Management Plan Amended Winter 1985-86.

The Tongass Land Management Plan is currently being revised. As part of the revision process, changes in Management direction for the Bohemia Mountain analysis area will be considered. Management activities will continue under the direction of the current plan until the revision process is completed. The proposed timber sale is consistent with the current Forest Plan direction and is scheduled to be sold prior to completion of the Forest Plan Revision.

Watershed

Drainage Basin

Description

The Bohemia analysis area includes portions of 49 watersheds whose streams terminate at saltwater, creating a watershed analysis area of about 76,660 acres with approximately 250 miles of inventoried stream. (This total acreage figure does not match the one for the analysis area because the analysis included entire watersheds, some of which go outside the analysis area boundary.) The Alaska Department of Fish and Game (ADF&G) catalog indicates that 10 of these 49 watersheds contain streams used by anadromous fish. These ADF&G watersheds total about 52,790 acres with about 180 miles of inventoried stream. Table 3-1 below illustrates some of the characteristics of a few of the watersheds in the Bohemia Mountain analysis area.

Table 3-1. Brief Descriptions of Some of the Bohemia Mountain Analysis Area Watersheds.

Watershed Name or Description	Area in Acres (sq. miles)	Total Stream Length (miles)	Drainage Density (mi./sq.mi.)
Duncan Salt Chuck Creek	23,008 (35.90)	74.50	2.08
Smallest Watershed	54 (0.08)	0.81	9.60
Largest Watershed	23,008 (35.90)	74.50	2.08
Smallest Drainage Density	129 (0.20)	0.24	1.20
Largest Drainage Density	54 (0.08)	0.81	9.60

These figures are determined from the Stikine Area channel type inventory and corresponding geographic information system (GIS) database, a computer mapping database. Drainage density is a measure of the total inventoried stream length in a basin divided by the basin area. Higher drainage densities indicate a watershed is more "dissected" than others, so there is higher risk that soil may erode into a stream channel. On the Stikine Area, drainage densities range from less than one to greater than 10 miles per square mile, with a median value of 2.8. The Bohemia watersheds have a median drainage density of 2.85 indicating that the Bohemia Mountain analysis area is typical of the Stikine Area.

The area receives a range of annual precipitation from 80 inches on the lowlands west of Bohemia Mountain to in excess of 120 inches on the top and south side of Bohemia Mountain. Most of the analysis area receives about 100 inches of precipitation per year. Approximately 63 percent falls between September and February. Runoff in the Duncan Creek watershed produces average annual discharges on the order of 5 to 8 cubic feet per second (cfs) per square mile. Two-year peak flows of 132 cfs per square mile may occur, usually associated with intense October storms, or early spring rain-on-snow events. Summer low flows of .58 cfs per square mile are possible, but are not considered potential impediments to fish passage and spawning success. Stream temperatures should remain within anadromous fish limits year-round.

Channel Classification

Stream channels on the Tongass National Forest have been classified and mapped using channel types--a system which allows for comparing channels of similar form and function. A description of the physical characteristics and management considerations of the approximately 38 channel types is provided in *Channel Types Field Guide: A Guide to Stream Mapping Units on the Tongass National Forest Chatham Area* (R10-MB-6), which has been updated and is currently being published.

Channel types have further been grouped by the stream processes which formed them, reflecting the long term interaction of geology, landform, climate, and resultant vegetation patterns. These process groups explain the basic interrelationships between the runoff, sediment transport, and vegetation patterns of channels in order that management guidelines and practices developed for each process group would consistently address the various management concerns of the different types of channels.

For this level of timber sale project planning, process groups were further grouped according to two basic management concerns. These include, first, streambank stability--alluvial channels on floodplains and fans, and some portions of mixed-control channels; and, second, sideslope stability--V-notches of varying depth and other channels where streambank stream stability is a smaller concern. For the management purposes considered here, a sideslope is the length of ground from the bankfull channel to the first major slope break above bankfull. This distribution of inventoried streams in the watershed analysis area is given in Table 3-2.

The majority of the inventoried streams are in well-contained bedrock channels (59 percent; see Table 3-2). These channels are managed for sideslope stability. Despite their bedrock nature, local areas of stream banks may be quite sensitive to disturbance. Being contained, most of these channels can route higher flood flows without overtopping their banks and easily transport silt, sand, and material the size of large cobbles.

On the east side of Portage Bay, these contained channels are steep but generally stable. They may, however, be adjoined by unstable side slopes with risk of failure.

On Bohemia Mountain, the majority of the inventoried streams contained channels with V-notches and steep, unstable side slopes. Many of them are actively eroding and have great amounts of large wood and logs which generally help provide for stability in the channels. Some of these logs, however, have created logjams which are presently causing great instability and erosion in specific segments of stream. The instability of the steep Bohemia Mountain channels is caused by the glacial till soils which are discussed in the Landform and Soils section (pages 3-7 and 4-7).

The upper reaches of mainstem Duncan Salt Chuck Creek are also contained and bedrock controlled, but have more moderate gradients than the unstable V-notches on Bohemia Mountain. Over time, the mainstem of the creek has cut its way through the glacial till to its present location in bedrock. Therefore, this segment of the mainstem also has naturally steep, unstable side slopes.

About 41 percent of the streams are alluvial, dependent on riparian vegetation and large, woody debris for stability, and sensitive to stream bank, stream bed, and floodplain disturbance (Table 3-2). These channels include portions of the lower mainstem of Duncan Salt Chuck Creek and lower valley tributaries, which would, in the evant of timber management, be managed for streambank stability. Annual flows (a frequency of once per year) *may* go over stream banks onto floodplains, fans, and terraces, with the opportunity to both scour backwater or side channels and deposit sediment and nutrients. At higher flows these streams will easily move large gravels, as well as sand and silt particles.

Table 3-2. Distribution of Channel Type Process Groups on the Bohemia Mountain Analysis Area (all watersheds, including those with ADF&G anadromous fish streams).

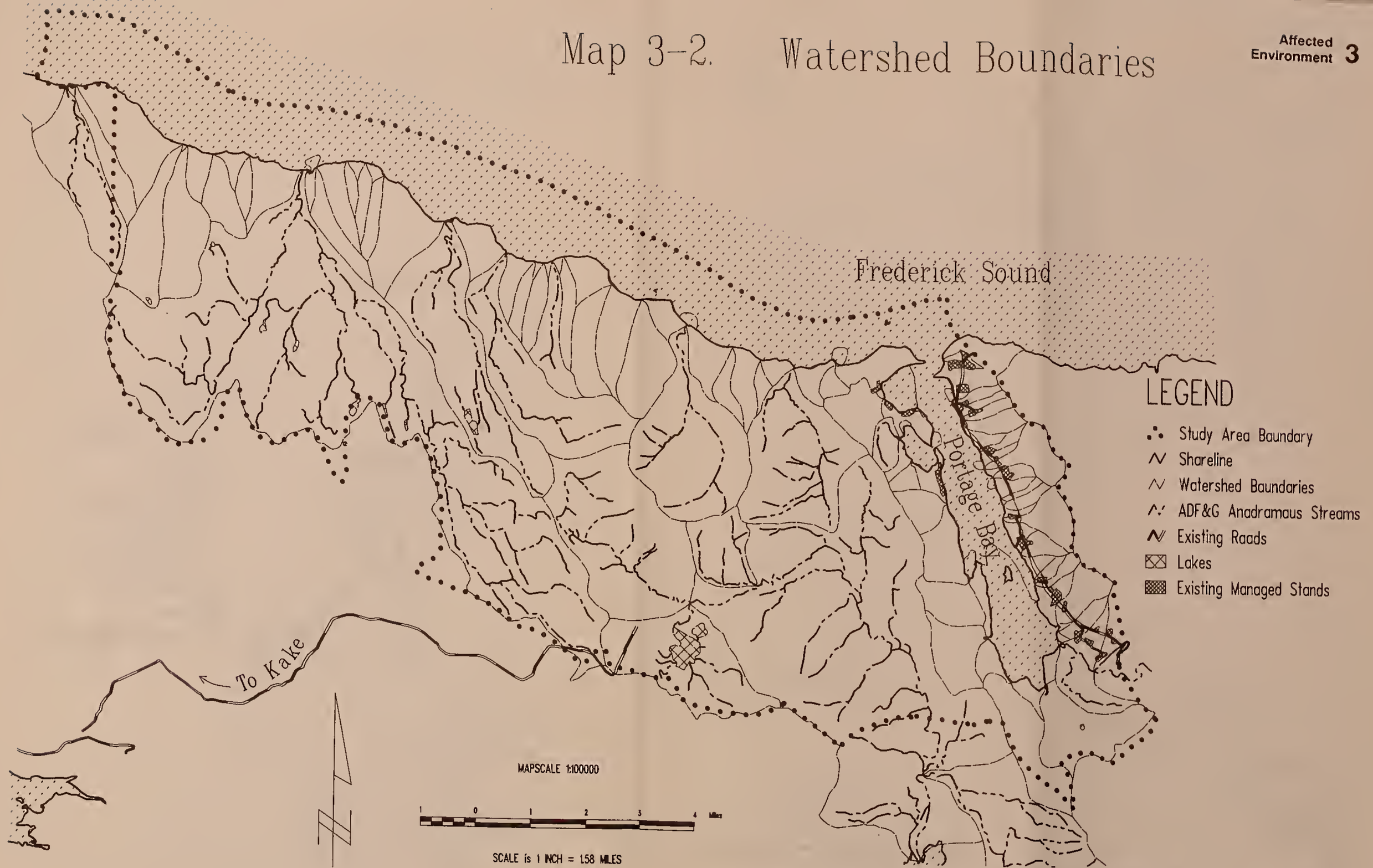
Managed For	Process Group	Stream Length (mi)
Streambank Stability	1. Low Gradient Floodplain[1] 2. Alluvial Fan 3. Mixed Control Moderate Gradient[2] 7. Placid or Glide 8. Estuary 9. Beaver Ponds	33.9 5.1 36.9 20.8 7.5 1.6 105.4
		= 41% of stream length
Sideslope Stability	4. Large Low Gradient Contained 5. Moderate Gradient Contained 6. High Gradient Contained[3]	15.0 68.8 68.9 152.7
		= 59% of stream length

[1] **Low Gradient Floodplain** - These channels generally have a rich, abundant community of fish due to good spawning gravels and large wood for good rearing habitat.
[2] **Mixed Control Moderate Gradient** - These channels provide excellent rearing habitat due to large wood accumulations in the streams.
[3] **High Gradient Contained** - These are the smaller, steep, bedrock channels either at high elevation or draining directly into salt water. Fish use of these streams or tributaries is very low.

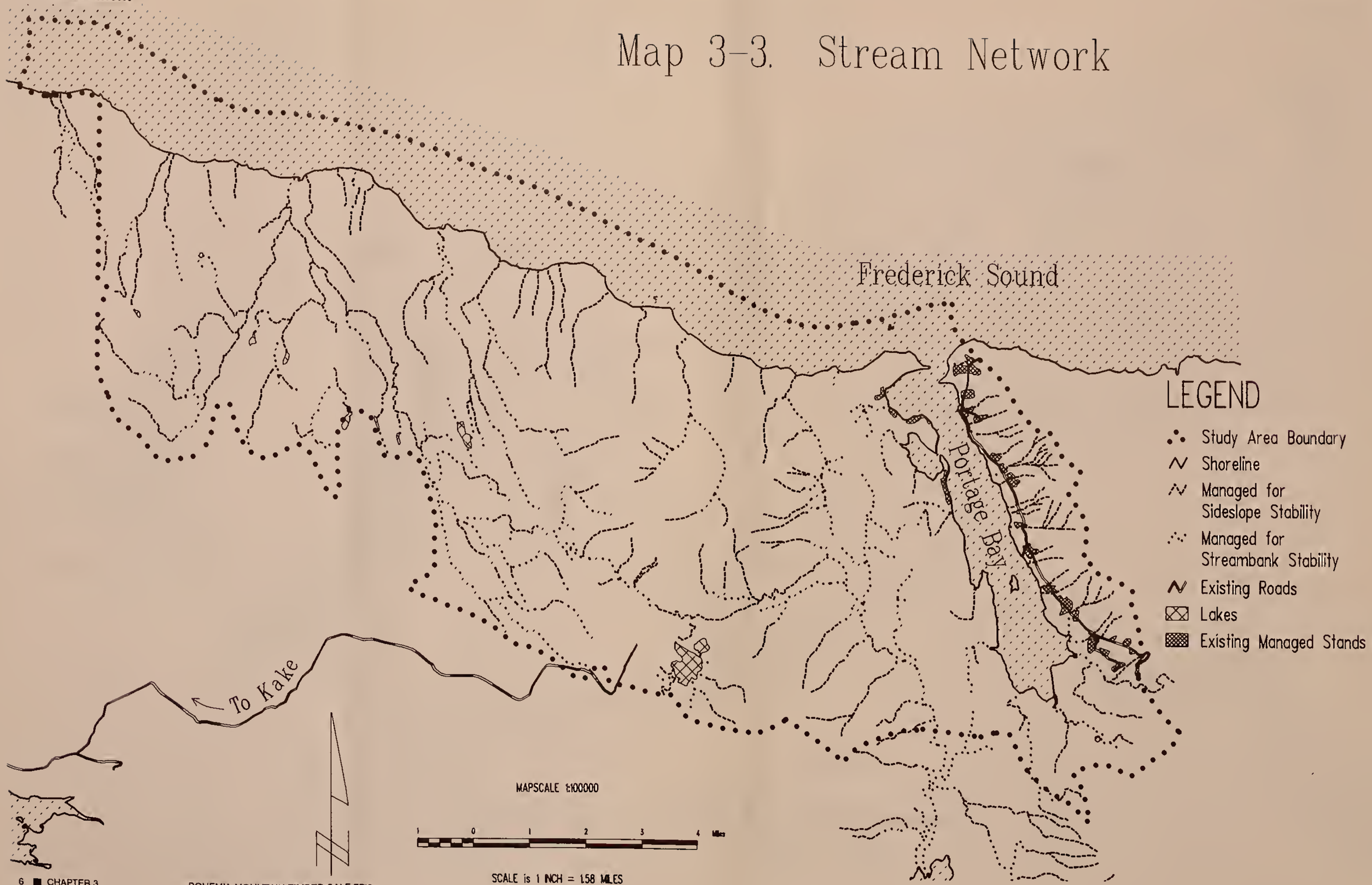
More detailed descriptions of the process groups can be found in Appendix A.

Map 3-2 shows the watershed boundary map for the Bohemia analysis area with only the ADF&G anadromous stream network. Map 3-3 shows the entire stream network grouped into two broad management concern classes, whether streambank stability, or stream sideslope stability.

Map 3-2. Watershed Boundaries



Map 3-3. Stream Network



Landform and Soils

The Bohemia Mountain analysis area, except the east Portage Bay portion, has the topography and geomorphology typical of the Kupreanof lowlands. It is strongly influenced by glaciers and has relatively low relief, consisting of few rounded hills, like Bohemia Mountain, protruding above the gently rolling lowland. The lowland soils are developed from thick deposits of glacial drift, which buried the pre-glacial landscape. Thick layers of organic peat cover most of the soil and reduces the productivity for the timber and most wildlife. The glacial drift is found on moderate slopes, from sea level to the top of Bohemia Mountain (2,300 feet). Marine terraces, below 400 to 500 feet elevation, such as the nearly level terrace between Frederick Sound and Bohemia Mountain and lowlands on each side of Duncan Salt Chuck Creek, are "glacio-marine" in origin, which is a glacial till deposited below sea level and commonly containing localized areas of layered materials left by water. Due to the instability of this material, road building, especially stream crossings, can be hazardous and mitigative measures are often expensive.

Steeper mountain slopes consist primarily of soils developed over bedrock, which are the most productive timber growing sites. They do present some management problems due to steep slopes and large, deeply incised, V-notched channels.

The area east of Portage Bay, the west slope of the Missionary Mountain Range, is unique from the rest of the analysis area. It is characterized by steep slopes and shallow soils developed in igneous bedrock. The lower concave slopes consist of deep soils developed from accumulation of materials at the foot of the slope.

Soil development in the Bohemia Mountain analysis area has been strongly influenced by high precipitation and cold soil temperatures, which leads to accumulation of organic matter. Tree rooting is generally very shallow, even on deep soils, occurring in the surface organic layers and the upper few inches of mineral soil. This rooting zone is typically very wet, acidic, and contains most of the nutrients available for plant growth.

Soil productivity and nutrient status can be influenced by timber management activities. Removing trees allows increased sunlight to penetrate and warm the soil, thus accelerating activity of microbes and making nutrients, especially nitrogen, more available to plants. Forbs, shrubs, and tree seedlings proliferate until the canopy closes and shades the soil surface.

Most nutrients are in the upper organic-rich layers, so when this layer is removed or disturbed, tree growth declines. Most landslides and landslide scars appear to be much more productive than the organic soils adjacent to them. This can occur by landslides, surface erosion, severe burning, yarding disturbance, or by displacement by roads, skid trails, landings, rock pits, or compaction and puddling, which impedes soil drainage and reduces productivity. Most undisturbed soils in the analysis area are protected by layers of organic matter and surface mats of vegetation, making them very resistant to surface erosion and not very productive.

Recent research on landslides over the past 20 years in southeast Alaska (Swanston 1989) has concluded that over 90 percent of all landslides were not related to logging and road building. However, these activities do increase the potential for landslides. So, to minimize that tendency, timber harvesting is usually excluded from particularly hazardous areas that have unstable soil types on steep slopes.

Vegetation, particularly tree roots, has a stabilizing effect on soils. Strength of tree roots tends to decrease significantly four to seven years after harvesting. This decrease in soil holding capability results in an increased likelihood of soil movement on steep slopes following clearcutting. Further, the displaced roots of uprooted trees can disturb the soil when windthrow occurs. Under natural conditions, windthrow is an important triggering device of debris avalanches and flows in southeast Alaska. Management practices such as partial or full suspension of logs are required on a site-specific basis (see unit cards, Appendix F) to minimize disturbance to surface horizons and prevent disrupting the natural surface and subsurface drainage patterns. A general stability analysis of the analysis area was done based on the Soil Resource Inventory of Kupreanof Island. The locations of hazardous soils are displayed in Map 3-4. Three classes, high, moderate, and low, rank soil units according to their relative potential for sliding (Table 3-3).

Table 3-3. Distribution of Soil Hazard Classes in the Bohemia Mountain analysis area.

Soil Erosion Hazard Class	Acres	Percent of analysis area
Low	54,953	81%
Moderate	9,571	14%
High	3,165	5%
Total	**67,689**	**100%**

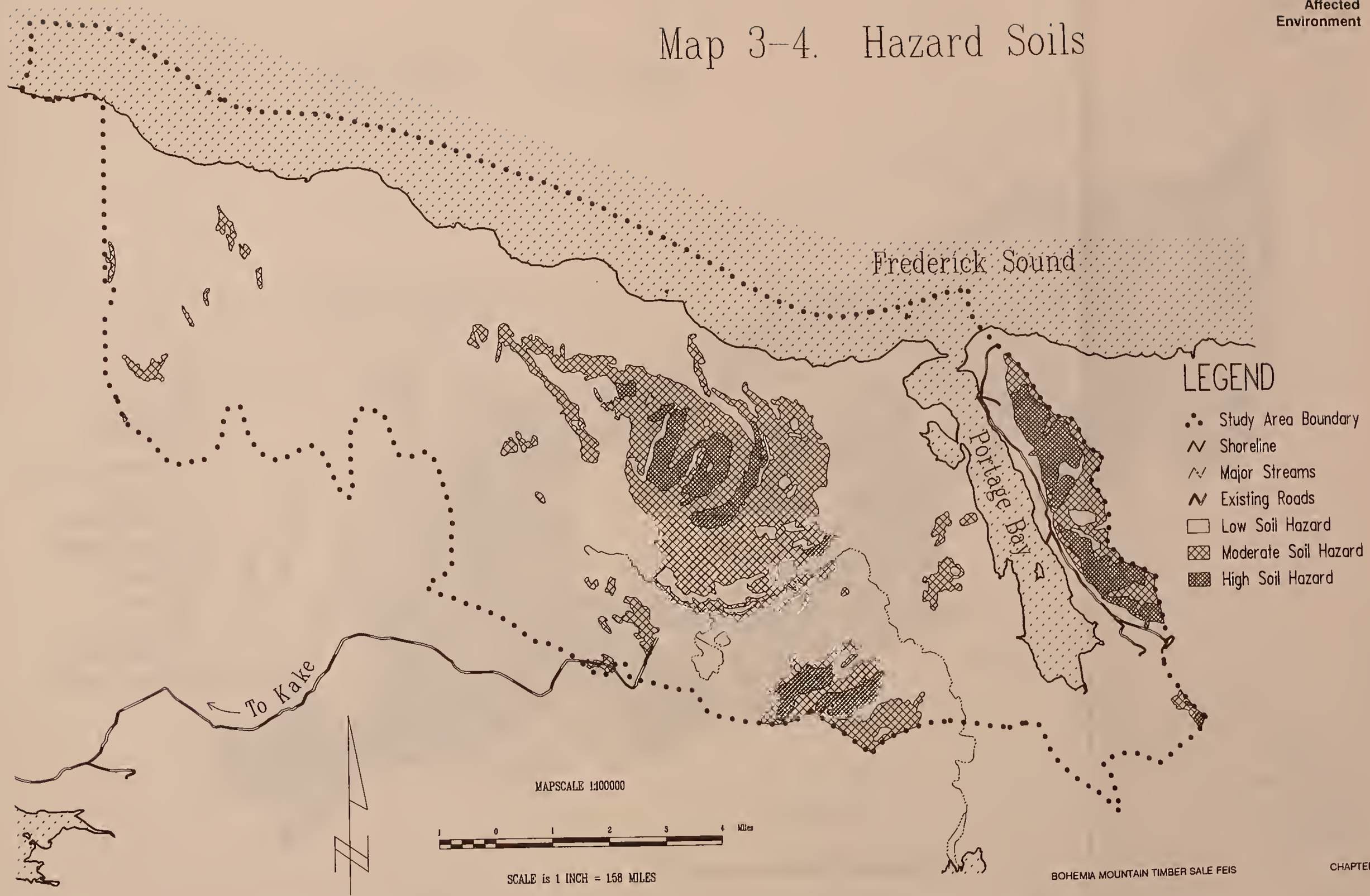
Wetlands and Floodplains

Like much of southeast Alaska, the Bohemia Mountain analysis area contains a large proportion of wetlands. Approximately 70 percent of the analysis area is classified as wetland according to the GIS soil resource inventory database (see Map 3-5). This definition is consistent with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989). At this time, due to legislative and administrative action, the Federal Manual for Identifying and Delineating Jurisdictional Wetlands is being revised. It is likely that the revised criteria will classify fewer areas as wetland types based on their function and value. These wetlands are comprised mainly of muskegs and forested wetlands as well as smaller amounts of estuarine, alpine meadows, and small lakes and ponds (see Table 3-4 and Map 3-5). Approximately 640 acres of floodplains have been identified, most of which are associated with Duncan Salt Chuck Creek or its tributaries.

Table 3-4. Distribution of Wetlands in the Bohemia Mountain Analysis Area.

Wetland Type	Acres	Percent of Area
Muskeg	16,171	24%
Freshwater Meadow	107	0%
Estuaries	41	0%
Forested Wetland	30,030	44%
Alpine Wetland	1,043	2%
Lakes and Ponds	244	0%
Total Wetlands	**47,616**	**70%**

Map 3-4. Hazard Soils



Map 3-5. Wetlands

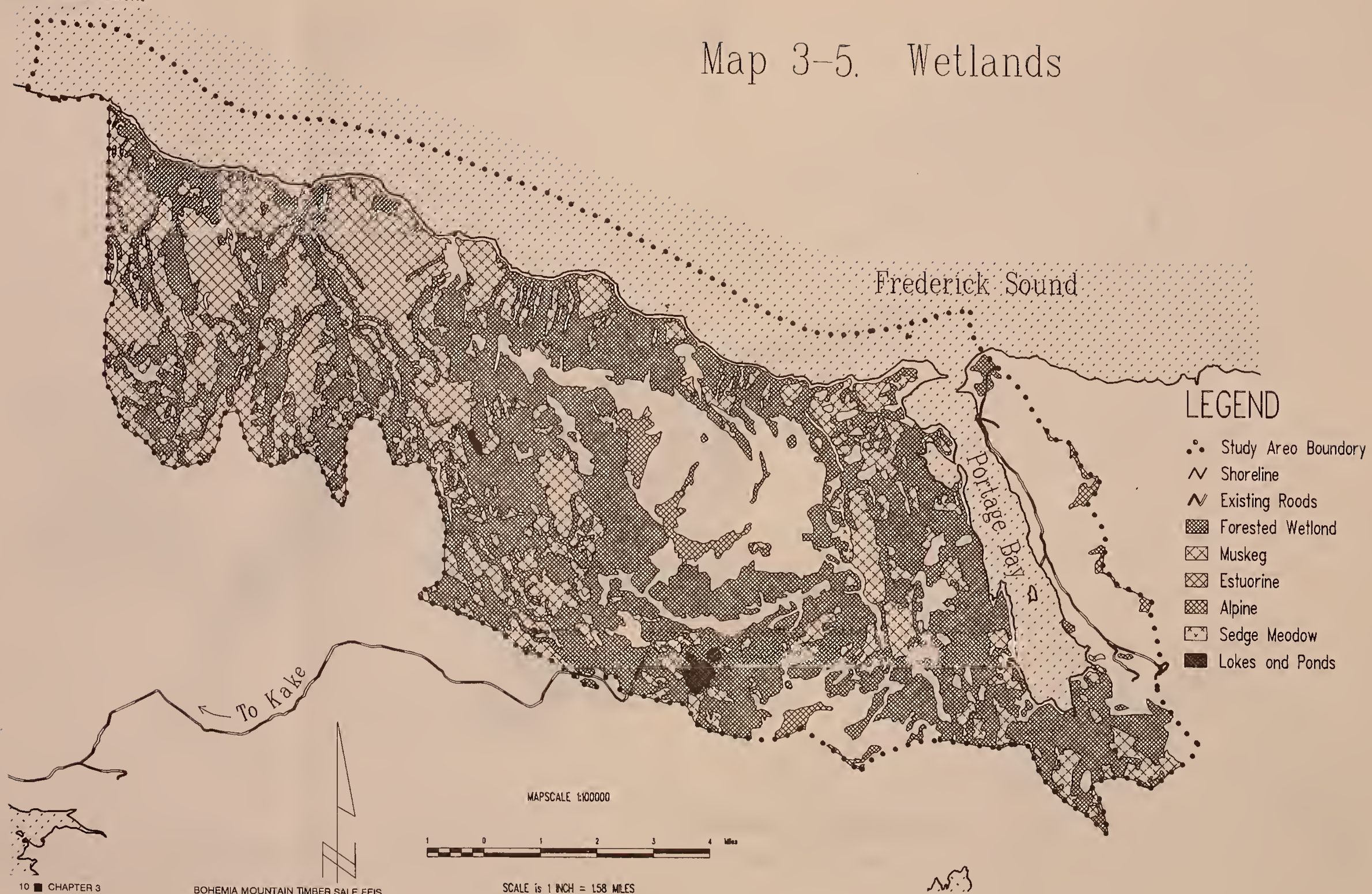
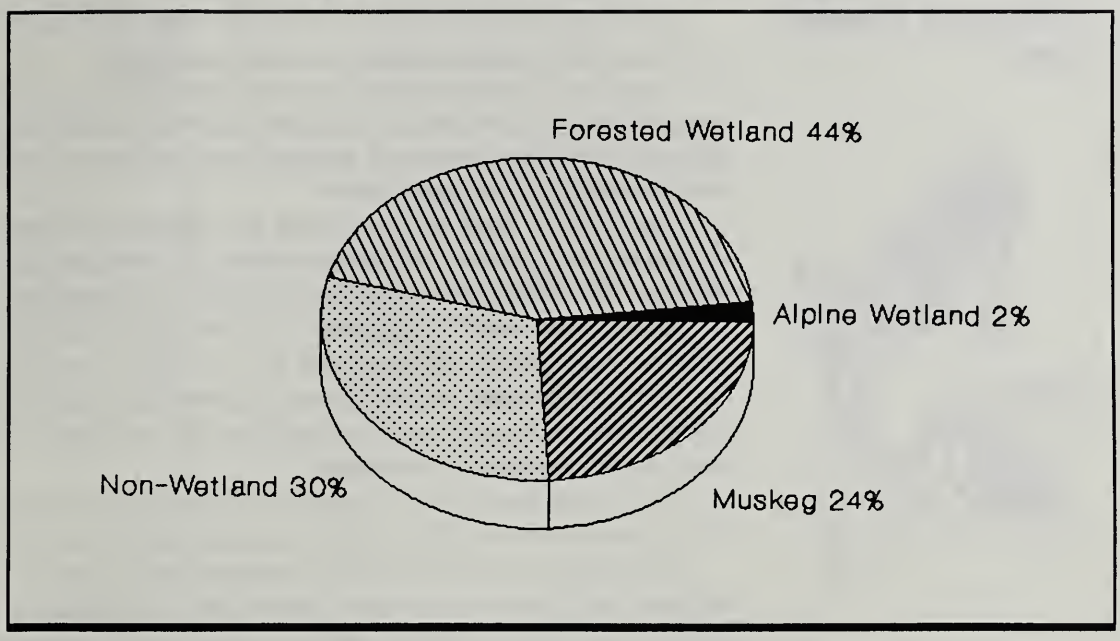


Figure 3-1. Proportion of Wetland Types.



Fish

Stream Classes

Within the Bohemia Mountain analysis area boundary, fisheries watersheds flow southerly into Duncan Canal and northerly and easterly into Frederick Sound and Portage Bay. The streams in the area are displayed in Map 3-6 as stream classes based on anadromous fish usage. The stream classes are defined as follows:

Class I: Streams with anadromous fish (fish ascending from oceans to spawn in fresh water) or adfluvial fish (ascending from fresh water lakes to spawn in streams.) Upstream lake and stream habitat could also be included if a structure allowed fish to pass over a migration barrier. High value resident sport fish populations are included in this class regardless of access.

Class II: Streams with resident fish populations and generally steep gradients are Class II streams. These populations have limited sport fisheries values. These streams generally occur upstream of migration barriers or are steep gradient streams with other habitat features that preclude anadromous fish use.

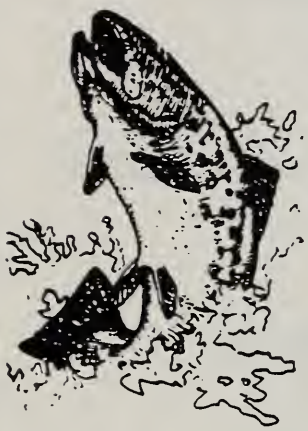
Class III: These are streams that have no fish populations but that could influence water quality in the downstream aquatic habitat.

Alaska Department of Fish & Game Numbered Streams

Duncan Salt Chuck Creek (ADF&G no. 106-43-059, Map 3-6 stream #10) is the largest stream in the analysis area. The lower 4.0 miles of stream are in the Petersburg Creek-Duncan Salt Chuck Wilderness. Stream surveys in recent years have shown 1,300 to 4,400 pink salmon spawning in the lower reach. The dark color of the water and deep canyon upstream create poor conditions for aerial survey. Field surveys indicated high numbers of coho and chum salmon in the upper reaches. A barrier in the upper 2.0 miles of stream on the main stem can possibly be eliminated to provide an increased potential annual coho production to a total of approximately 4,500 adults.

Portage Bay Creek (110-16-002, Map 3-6 stream #9) has high salmon production, although it is limited to the lower one mile of stream. Enhancement plans include fish ladder construction to access the upper productive habitat. Pink salmon counts range from 70 to 13,000. Chum salmon average 350 annually.

Numbered Streams (cont.)



Dry Cove Portage Bay (110-16-005, Map 3-6 stream #8). No signs of salmon. However, the potential exists for coho production.

1st stream west of West Point (110-16-006, Map 3-6 stream #7). Pink salmon escapement counts range from 150 to 2,300. Coho production is estimated at 650 annually. A spring has been located in the upper reach of the stream that may have potential for enhancement.

2nd stream west of West Point (110-16-007, Map 3-6 stream #6). Escapement counts for pink salmon range from 50 to 4,000 annually. Most of the salmon production occurs intertidally and upstream for about 1,000 feet ending at barriers.

3rd stream east of Big Creek (110-16-008, Map 3-6, stream #5). Recent years indicate pink salmon escapement counts ranging from 100 to 200.

2nd stream east of Big Creek (110-16-009, Map 3-6 stream #4). Pink salmon counts over the years have ranged from 70 to 4,000. Juvenile Coho salman were also noted rearing in this stream.

1st stream east of Big Creek (110-16-010, Map 3-6, #3). Pink salmon escapement counts range from 125 to 2,500 over the years from 1971 to 1990.

Big Creek (110-16-11, Map 3-6 stream #2) is part of a large watershed. However, barriers exist on the main stem upstream of tidewater and on all main tributaries. Escapement counts for pink salmon range from 200 to 8,500. Additional road access to the area would reduce stream enhancement costs.

East Schooner Creek (110-16-012, Map 3-6 stream #1). 1st stream just west of analysis area. Barriers are present above tidewater on this small stream and only a few pink salmon were counted when surveyed.

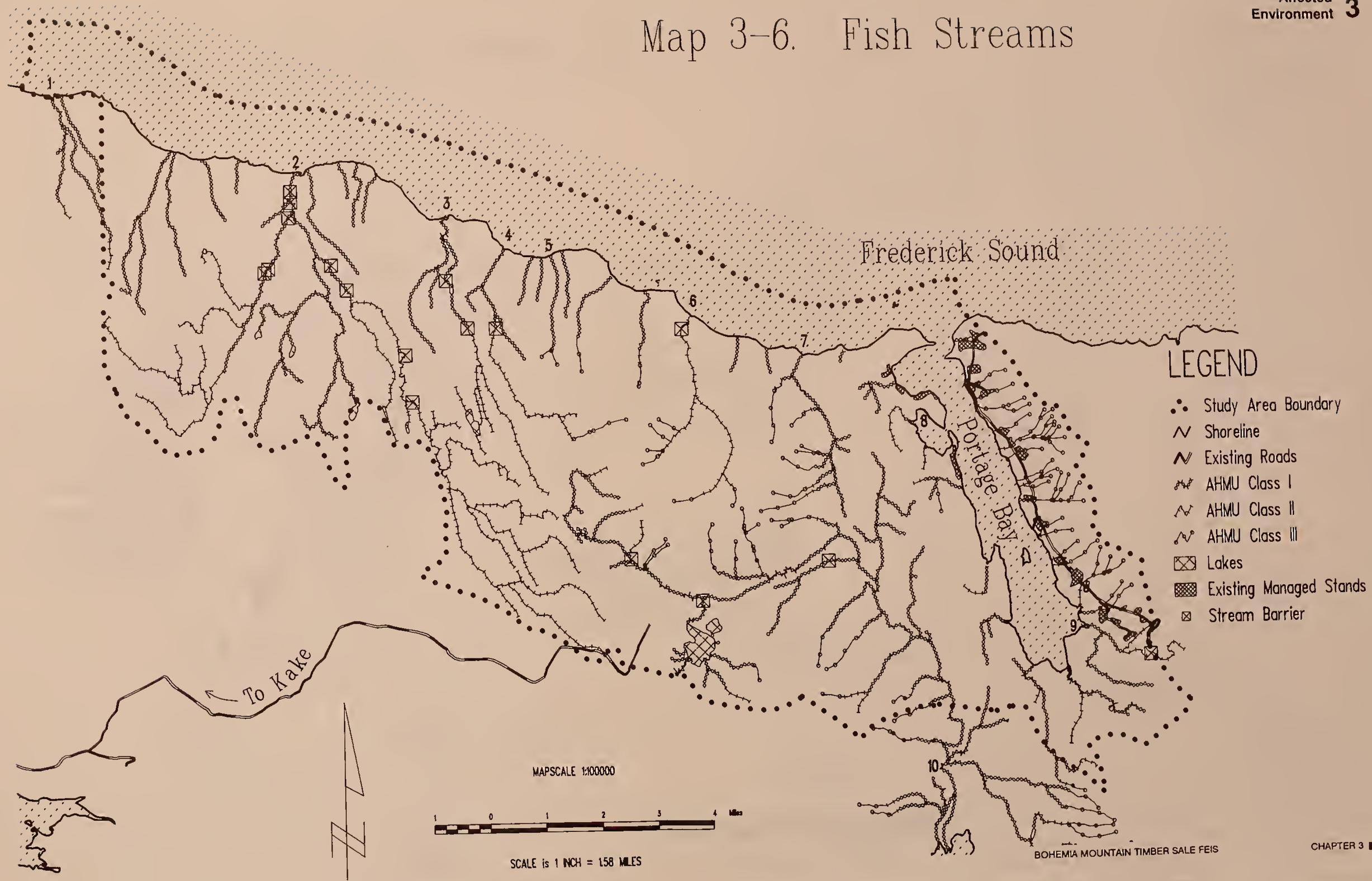
Wildlife Habitat Maintained

The current Tongass Land Mangement Plan specifies that a percentage of operable commercial forest land in each VCU will be maintained for wildlife habitat. Deferring from harvest a portion of the commercial forest land within each VCU (CFL such as beach fringe, Class I and II stream buffers, and within-stand leave trees) through the planned 100-year timber management rotation assures that habitat will be available for old-growth-dependent species throughout the planning period (for example, the life of the current Forest Plan is roughly 10 years).

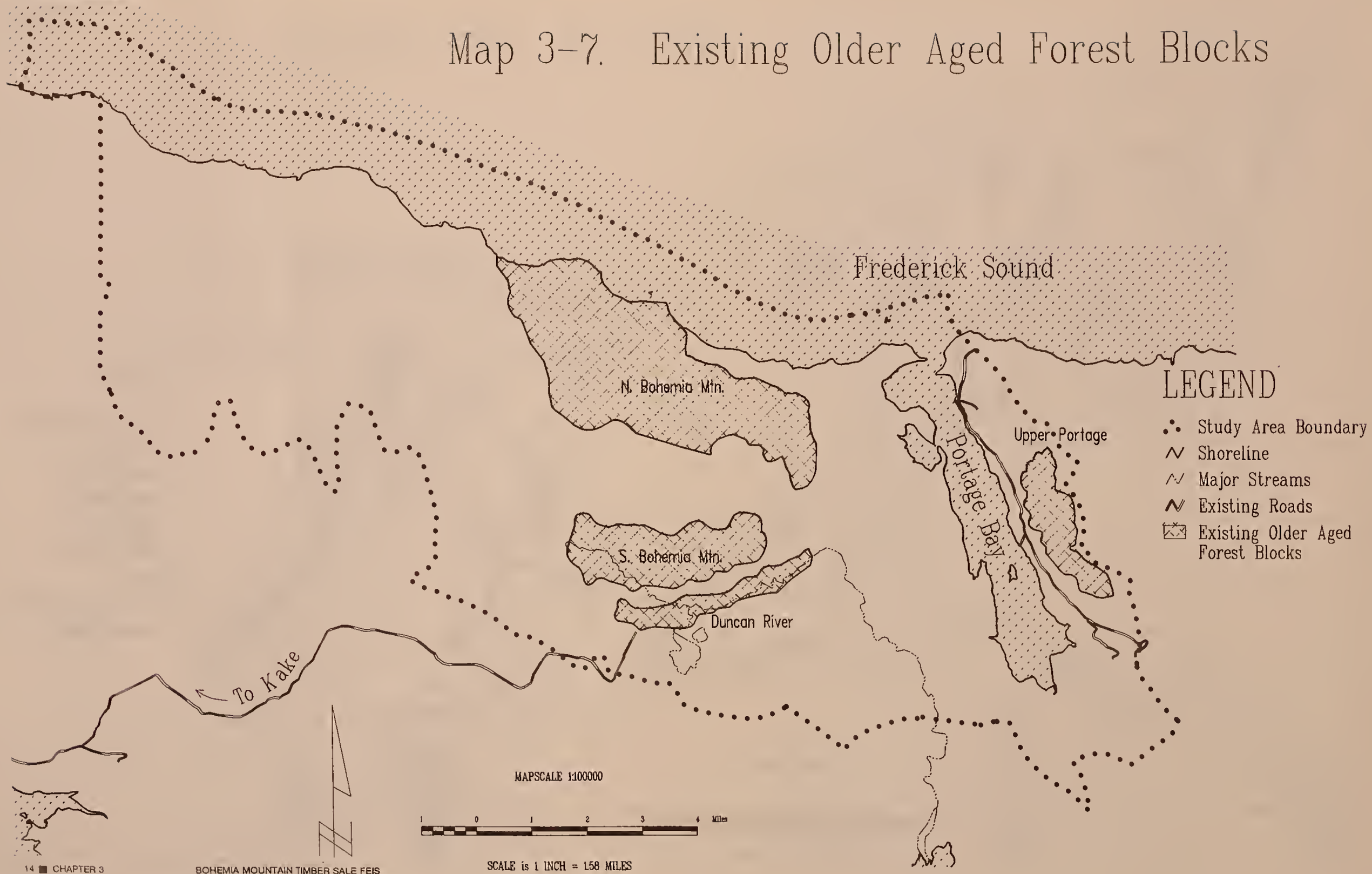
The combined wildlife habitat acreage to be maintained for the three value comparison units (VCU's) comprising the Bohemia Mountain analysis area totals 1,131 acres. This does not include the acreage allocated to Land Use Designation (LUD) II (VCU 441.1) which prevents normal timber harvest except for insect infestations.

A total of 9,131 acres of high value wildlife habitat (see glossary) were identified and mapped in the analysis area, using computer modeling and field surveys. These acres include 3 habitats in order of importance for a diversity of wildlife species: estuary, beach fringe, and riparian.

Map 3-6. Fish Streams



Map 3-7. Existing Older Aged Forest Blocks



Wildlife

The analysis area supports a large and diverse variety of resident and seasonal wildlife species including mammals, birds, reptiles and amphibians. More than 250 bird species occupy the area in the summer.

It is difficult to analyze habitat effects for each individual species. Therefore, the National Forest Management Act requires that management indicator species be identified for each national forest and be used for environmental analysis. The management indicator species were selected to reflect the diverse range of land types, plant communities, and special habitat requirements, as well as the equally diverse adaptability to changes in habitat, predation, hunting pressure, and other variables important to the well-being of wildlife. For purposes of this analysis, five species have been selected as indicator species for the area.

Species	Reason for Selection
• Sitka blacktail deer	Important game species, sport and subsistence
• Pine marten	Biodiversity (older aged), important furbearer
• Black bear	Game species, indicator of estuarine habitat
• River otter	Indicator of riparian habitat, furbearer
• Bald eagle	High public interest, older aged beach habitat

The first four are important indicators of the majority of the species within the area that are utilized for sport hunting, commercial trapping, and subsistence. Deer and particularly marten reflect older aged forest requirements critical to the needs of many other resident species including birds. Bald eagles are numerous and not considered threatened or endangered in Alaska, but because they are sensitive to forest management and protected by Federal Law, impacts on their nesting habitat must be analyzed. Nonconsumptive recreation such as wildlife viewing is fast becoming a significant pastime for both Alaskans and non-residents, and eagles are a favorite species. By far, the majority of this demand is along shorelines and beach fringe, which eagles use almost exclusively for nesting. Protection of bald eagle habitat will ensure the continuation of shoreline viewing for eagles and a variety of other mammals and birds that frequent this environment.

Habitat Suitability Index

The capability of the analysis area to support the selected indicator species was analyzed with the help of computer habitat capability models developed for the Tongass Forest Plan Revision effort. These models generate habitat suitability indices that display the relative quality of habitat by species. It is important to note that the models do not reflect actual population estimates. Rather, they reflect potential numbers of the indicated species which the habitat is capable of supporting. The habitat suitability index (HSI) generates a range of values from 0 to 1, with "0" having no value for the selected species, ".5" reflective of average habitat, and a maximum of "1" indicating optimum habitat. A value of 0.20 would indicate that the area is currently capable of supporting about 20 percent of the animals that the very best habitat could support.

Sitka Black-tailed Deer

The historical importance of deer winter range in portions of the Bohemia Mountain analysis area is well-documented. Deer browse transects located along the west shoreline of Portage Bay (sec. 34) estimate deer utilization of 45 percent of the *Vaccinium* (blueberry) twigs during the winters from 1961-62 to 1969-70. For reasons that are not fully understood, deer numbers drastically declined and have not recovered since severe winters in the early seventies. ADF&G records show less than one percent utilization along the same transects in 1979. In the winter of 1978-79, 24 deer were released in this area in an attempt to "jump start" deer recovery. Although deer numbers appear to be increasing slightly, they are still far below the high levels of the sixties and are not near modeled habitat capability.

Historically, black-tailed deer populations have been closely linked with winter severity (Merriam 1970) and predation mortality (Van Ballenberg and Hanley 1984). Even in the best winter habitat, deer die-offs are common. Predators normally inhibit the deer recovery, but not to the extent or length of time found in the area. There has not been a hunting season in this area since 1975.

The HSI model used for this analysis, assumes moderate snow levels (S2) and wolf predation and predicts the analysis area is currently capable of supporting 1,374 deer.

Pine Marten

Marten are the most old-growth-dependent of the species being analyzed. Most cavity nesting or denning species will be represented by marten habitat requirements and consequently protected as long as adequate habitat for marten is maintained.

Historically, marten inhabited only the mainland of southeast Alaska. Only through cooperative transplant projects with the Alaska Department of Fish & Game (ADF&G) and the Forest Service are marten present on many islands.

Due to their high degree of metabolic activity, marten require proportionately more food than most other species (Worthen and Kilgore 1981). Their diet consists primarily of small mammals, birds, insects, and fruit. Snags provide important marten habitat, with the tops used as resting sites and cavities as denning sites in both summer and winter (Spencer 1987).

Marten are a valuable furbearing species. Continually fluctuating pelt prices normally determine the trapping pressure in an area. Portions of the Bohemia Mountain analysis area are excellent marten winter habitat, particularly Portage Bay and the Frederick Sound shoreline. Table 3-5 indicates the number of marten taken by trappers in the vicinity of the analysis area (#2011) and for all of ADF&G management unit 3 which includes Kupreanof and adjacent islands.

Table 3-5. Annual Harvest of Marten by ADF&G Harvest Units

	1984-85	1985-86	1986-87	1987-88	1988-89
Minor Harvest Area #2011 (includes more than analysis area)	13	33	16	82	N/A
Total for Mgmt. Unit 3*	272	155	110	357	N/A

*A portion of the area is non-National Forest land.

The HSI model for marten predicts the analysis area alone is currently capable of supporting 92 marten (note, based on first year data from a marten ecology study jointly conducted by the Forest Service and Alaska Department of Fish and Game, marten population densities projected in the marten model have been reduced by 32%).

Older-aged forests are unique ecosystems distinguished by old trees and related structural attributes, including tree size, accumulation of large woody material, number of canopy layers, and tree species composition. The older aged forest areas provide habitat necessary to ensure that viable population levels of old-growth-dependent species are maintained and well distributed over time.

For the purposes of this analysis, older aged forest blocks were defined as a minimum 800 acres in size and comprised of volume class 4 or better timber. The minimum width dimension is ¼ mile. To be considered as single blocks, connecting corridors between patches must be a minimum of 500 feet wide. There are currently four blocks within the analysis area that meet the criteria defined above.

In the early 1970's, the Forest Service adopted a practice of staggered settings that results in a regular pattern of clearcuts and equal-sized leave strips between units. When viewed from the individual stand level, this harvest pattern maximized edge habitats to the benefit of many gamebirds and big game species, and creation of edge was, and remains, a game management habitat objective.

A recent broader perspective of wildlife ecology has recognized that a group or guild of wildlife prefers forest interior conditions not affected by openings or abrupt ecotone edges created by forest management. Certain species found to be sensitive to forest management include the neotropical migrant forest-nesting songbirds. Recent research has demonstrated that edge effects may extend up to 2 to 3 tree heights into the forest stand.

When viewed at a larger scale of aggregation of stands within an entire watershed, staggered setting harvest techniques have fragmented many forest landscapes, thus minimizing the availability of forest interior habitats. Simulation studies have demonstrated that when as little as 50 percent of the forest in a watershed has been harvested under the staggered setting regime, little if any forest interior habitat conditions remain. This management system could have negative consequences to maintenance of biodiversity.

On the Tongass National Forest, several Management Indicator Species proposed for the Revision of the Tongass Land Management Plan may be sensitive to forest effectiveness. In addition, several species that occur on the Tongass National Forest were found in a northern California study to be either sensitive to fragmentation (for example, sharp-shinned hawk and blue grouse) or were rarely detected along edge habitat (for example, brown creeper, golden-crowned kinglet, and Townsend's warbler).

In addition to the potential for abrupt edge to reduce wildlife habitat suitability, there are other negative consequences of harsh edge. The zone of edge influence can extend 2-3 tree lengths into the forest. It has the potential to disrupt natural growth in the old stands because harsh edge will change the influence of wind, temperature, humidity, and light naturally occurring in relatively stable old-growth systems. Finally, edge created by clearcutting harvest systems exposes a forest stand to increased susceptibility to windthrow in high-risk landscape positions.

Snags for cavity nesting birds and mammals are also important habitat components. Snags are defined as dead trees at least 15 inches in diameter at breast height and ten feet in height or taller. Hairy woodpeckers require an estimated average of 672 snags per 100 acres to achieve maximum populations in southeast Alaska. The less dependent red sapsucker requires approximately 160 snags per 100 acres.

Stand data for the analysis area estimate there are currently greater than 2,000 snags per 100 acres of forested habitat (lands capable of supporting 10 percent tree cover).

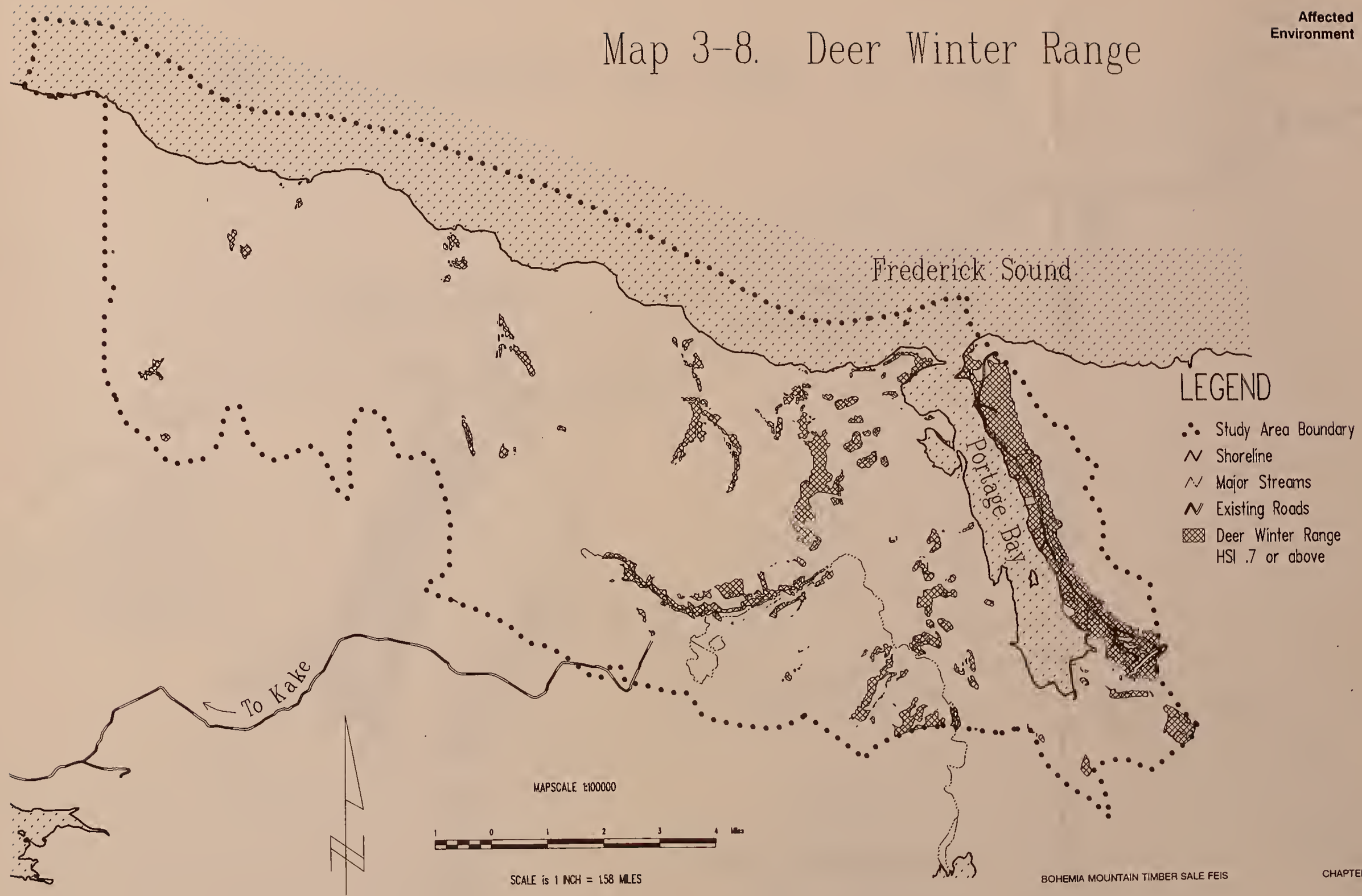
Black Bear

The analysis area currently supports a high black bear population. Aerial and ground surveys conducted in 1989-90 show high densities of black bear over most of the area. Although black bear are omnivorous and will utilize and forage in all available habitat, this use is seasonally concentrated in salmon areas and in areas of early season forage. Riparian, beach fringe, estuarine, and lake shores are all preferred habitat (see Map 3-8).

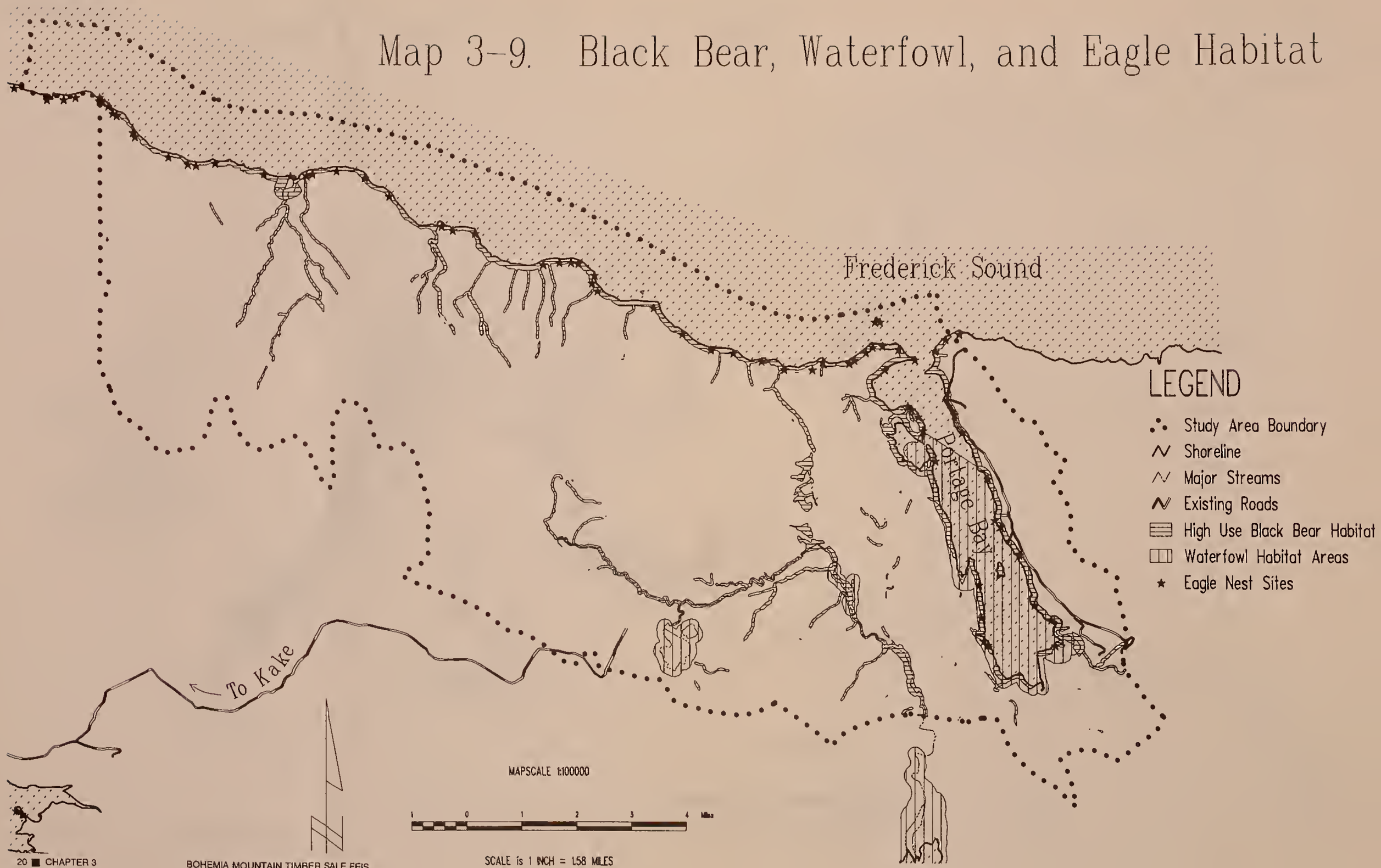
Cover and available denning sites are important factors when rating black bear habitat as desirable. Research conducted on Mitkof Island by Erickson in 1982 highlighted the importance of maintaining denning sites in managed areas.

Black bear are hunted both for sport and subsistence. The Portage Bay shoreline is particularly popular for bear hunting. Harvest data for an eight-year period, 1980-87, range from a high of 36 bear taken in 1985, to a low of nine in 1980, with an average of 21. These harvest figures represent legally taken bear for the whole analysis area that were reported to the Alaska Department of Fish and Game. Actual figures are likely to be higher because not all bears killed are reported.

Map 3-8. Deer Winter Range



Map 3-9. Black Bear, Waterfowl, and Eagle Habitat



River Otter

River otter generally use uplands close to the beach (Larsen 1983) where habitat is described as beach fringe. Field surveys in the analysis area during the summer of 1990 noted otter a considerable way inland, particularly along Duncan Salt Chuck Creek (Daniels, personal communication).

Most riparian furbearers, otter included, are dependent on large organic debris and trees along beaches and streams. The large root "wads" and downed tree trunks create undercuts and hollows that provide den sites and cover and concentrate prey species.

River otter are trapped for their fur in southeast Alaska. Access in the analysis area is limited due to a lack of roads and difficult boating during the trapping season. Table 3-6 displays harvest figures for river otter taken within the analysis area.

Table 3-6. Annual Harvest of River Otter by ADF&G Harvest Units.

	1984-85	1985-86	1986-87	1987-88	1988-89
Bohemia Mtn. analysis area	0	3	3	N/A	N/A
Total for Game Mgmt. Unit 3*	141	51	45	N/A	49

*A portion of the area is non-National Forest land.

Bald Eagle

The analysis area shoreline provides excellent bald eagle nesting habitat as shown by the number of surveyed nests. Bald eagles in southeast Alaska nest almost exclusively within 500 feet of the beach in large, old-growth trees. (See Map 3-7.)

Concerns over impacts associated with development near eagle nests resulted in the establishment of a Memorandum of Understanding between the Forest Service and the U.S. Fish and Wildlife Service in 1984. One of the key elements of this agreement is the requirement to provide a 330-foot "buffer strip" around identified eagle nests. Population estimates based on aerial surveys show an increase from about 7,000 eagles in the early 1970's to over 12,000 in 1987 throughout southeast Alaska.

Other Species of Interest

Waterfowl

Several bays and estuaries provide excellent habitat for resident and migrating waterfowl. Most notable are Portage Bay, especially the area south of Stop Island and Dry Cove; the Frederick Sound shoreline, and several small inland lakes and ponds. Portage Bay supports the most waterfowl hunting within the analysis area (Map 3-8).

Blue Grouse

Blue grouse are widely dispersed throughout the area. Field surveys conducted in the spring of 1989 showed high densities of male territories located over a wide range of habitat types and elevations. Because of poor access, there is little hunting pressure in the area.

Non-Game Birds
Important shorebird habitat locations within the analysis area are the estuarine flats at the head of Portage Bay, the Frederick Sound shoreline, Bohemia Lake, Goose Marsh, and several beaver-dammed riparian areas. Portage Bay and offshore waters are used by guillemots, murres, marbled murrelets, several gull species, and various other seasonal migrants. Arctic terns use the southern tip of Stop Island for nesting habitat.

The inland forested and mixed muskeg habitats are occupied by most, if not all, resident Stikine Area bird species. The area also provides important resting and feeding habitat for spring and fall migrants.

Moose
Moose are present in low numbers throughout the area. Historically, moose have never been numerous, which is attributed to the lack of high-quality winter browse species such as willow, red osier dogwood, cottonwood, and mountain ash. Wintering sign was noted at Bohemia Lake and Portage Bay during field surveys.

Threatened, Endangered and Sensitive Species

The humpback whale and northern (Stellar) sea lion are the only listed species known to occur in the vicinity of the analysis area.

The endangered humpback whales are frequently observed off the Frederick Sound shoreline. No important feeding or travel ways are within the analysis area.

Northern sea lions were listed as a threatened species by the U.S. Fish and Wildlife Service in June of 1990. There is no important sea lion habitat within the area proposed for management.

The following eight species have been classified as sensitive on the Tongass National Forest: osprey, Peal's peregrine falcon, trumpeter swans, dusky Canada geese, Montague Island vole, Fish Creek chum salmon, King River salmon, and Wheeler Creek king salmon.

There are no records of sensitive species occurring within the analysis area.

Special Emphasis Species

The northern goshawk and marbeled murrelet are species that are not formally listed as threatened, endangered, or sensitive but because of poor information on management implications they require special consideration. Both species require older aged forest habitat. The murrelet is currently being proposed as threatened in the continental United States and possibly in Alaska. Preliminary models and guidelines are available to help display habitat requirements and analyze management effects. The murrelet is currently being proposed as threatened in the continental United States. Preliminary models and guidelines are available to help display habitat requirements and analyze management effects. In addition, base-line population densities using approved survey techniques were begun in the summer of 1991. The extensive surveys conducted in the vicinity of the analysis area produced 2.47 murrelets/sq. mile. A similar survey taken near Rowan Bay on Kuiu Island totaled 29.11 murrelets/sq. mile. The goshawk was designated as a management indicator species in the 1990 Resources Planning Act. It was proposed but not selected as a management indicator species in southeast Alaska due to lack of basic ecological data.

Subsistence

With the passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980, Congress formally recognized the importance of subsistence resources to rural communities in Alaska. ANILCA defines subsistence as the following:

The customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal and family consumption; and for customary trade (ANILCA, 16 USC 3113).

No prior evaluations, as mandated by ANILCA, have been done for the Kupreanof Island area. However, the courts have ruled that the Forest Service must consider cumulative impacts of past, present, and reasonably forseeable activities when conducting subsistence analyses. See Chapter 4, Subsistence section for a discussion of these potential impacts.

Mean income is an indicator of the importance of subsistence to individual communities. Ideally, households with higher incomes would be able to supply more of their needs through the cash economy. However, higher incomes do not necessarily indicate a lesser dependence on subsistence resources. One example is the sharing of harvested subsistence resources by higher income households. These resources are shared with friends, family, neighbors, and those unable to harvest their own.

Subsistence harvesting of resources plays a key cultural role in rural communities. Even if individual households could purchase all their subsistence needs through the cash economy, the socio-cultural and socio-economic processes of procuring, gathering, and sharing subsistence resources is an important cultural aspect of southeast Alaska. Traditional foods sought for subsistence may not be available through any other means. Occasions for procuring subsistence resources are often incorporated in community and household social events. Historical use patterns, such as the annual cycle of small family groups moving to summer fishing camps, then to larger winter villages where a number of family groups reside, are linked to the traditional subsistence harvests.

Subsistence Communities

Communities using the Bohemia Mountain analysis area for subsistence include Kake, Petersburg, and Wrangell. A limited background on individual community history, population, economy, and subsistence uses for each community follows.

Kake

The town of Kake is situated along the northwestern shore of Kupreanof Island and is predominantly inhabited by Alaska Natives. The earliest occupation and exploitation of subsistence resources by the Kake Tlingit predates historical records. The Kake people have traditionally used the area between Kake and Portage Bay. Based on the results from the Tongass Resource Use Cooperative Survey (TRUCS), Kake used the analysis area for hunting, fishing, and gathering of subsistence resources. (See maps in Appendix D).

Logging on the private and public lands near Kake has resulted in an extensive road system which residents use to gain access to areas for hunting, fishing, and gathering.

In 1985, Kake's population was calculated to be almost 70 percent Alaska Native. Major sources of income include fishing and fish processing (28 percent), timber harvesting (18 percent), longshore working (13 percent), working in schools (8 percent), and in government (1 percent). Employment within the community is highly seasonal, with more than 50 percent unemployment reported during a 1985 social survey. In a more recent survey, there appear to be two distinct groups based on income: one group of incomes is in the $5,000 - $10,000/year range and the second group is in the $30,000 - $40,000 range. The second group probably represents those residents who were seasonally employed at the Kake Tribal Logging Company (Firman and Bosworth 1990:51).

Petersburg

Petersburg is located on the north tip of Mitkof Island, at the northern end of the Wrangell Narrows. Most employment is in the fishing, fish processing, tourism, and logging industries, and in government services.

In 1987, the community's population was estimated to be approximately 3,282 residents (Smythe 1988). Of this total, approximately 13 percent were believed to be Alaska Natives (ADF&G 1989). Mean per person income in 1987, was recorded at $12,602 (Kruse and Frazier 1988). Employment sources are dominated by seafood procurement and processing (36 percent), government (28 percent), retail sales (13 percent), and construction (9 percent). Many of these activities are seasonal in nature.

Wrangell

The community of Wrangell is located in the east-central portion of southeast Alaska, on the northern point of Wrangell Island, about seven miles west of the Stikine River.

The Wrangell Forest Products sawmill is the town's largest employer and tourism is an emerging industry.

A 1985 population estimate of 2,836 residents included roughly 40 percent Alaska Natives. Mean per-person income for the community in 1987 was about $11,989 (Kruse and Frazier 1988). Major sources of employment are within the following areas: government (25 percent), retail sales (19 percent), manufacturing (16 percent), and fishing and fish processing (13 percent). Employment in the tourism, retail sales, and fishing sectors of the economy are primarily seasonal.

Subsistence Use

Kake

Kake residents rely heavily on deer, bear, seals, grouse, waterfowl, fish, trapping of furbearers, and gathering of shellfish, seaweed, and berries. The average annual harvest of subsistence resources was reported to be about 160 pounds per person in 1987. This figure is further refined to reflect the use of deer (24 percent), salmon (22 percent), and other finfish (21 percent). Subsistence provides about 20 percent of the community household needs.

Petersburg
Residents of Petersburg use deer, bear, moose, salmon, halibut, other finfish, waterfowl, clams, crabs, and berries. Annual harvest of subsistence resources averaged about 203 pounds per person in 1987. Emphasis appears to focus on salmon (23 percent), other finfish (22 percent), and deer (22 percent). Subsistence resources provide roughly 30 percent of the household food supply.

Wrangell
Deer, moose, bear, waterfowl, salmon, halibut, other finfish, shellfish, and berries are harvested by Wrangell residents. Annual harvest of subsistence resources was estimated to be about 165 pounds per person in 1987. This total was subdivided into the following breakdown: shellfish (25 percent), salmon (18 percent), and other finfish (26 percent). Subsistence resources provide about 23 percent of the household needs for Wrangell residents.

Use of Bohemia Mountain Analysis Area

The Bohemia Mountain analysis area includes three Value Comparison Units (VCU's): 424, 441.1, and 442. Kake, Petersburg, and Wrangell have documented use within the analysis area.

Deer hunting has played an important part in the subsistence lifestyles of these communities. A dramatic deer population decline took place throughout much of south-central and southeast Alaska during the late 1960's and again in 1975, when the Alaska Board of Game closed all of Mitkof, Kupreanof, and Kuiu Islands to all deer hunting. These islands currently remain closed to sport and subsistence harvest, although there will probably be a deer hunting season on Mitkof Island in 1991.

Information derived from the Tongass Resource Use Cooperative Survey (TRUCS), as displayed in the Draft Tongass Land Management Plan Revision, documents subsistence uses for the following categories in the analysis area: Most Reliable Deer Hunting Areas, Most Often Used Deer Hunting Areas, and Salmon and Invertebrate Harvest Areas. Utilization by community and VCU follow: VCU 424--Kake, Petersburg, and Wrangell; VCU 441.1--Petersburg and Wrangell; and VCU 442--Petersburg and Wrangell. Traditional means of access to the analysis area has been by boat and by foot. Access by residents from Petersburg and Wrangell has almost always been by these two methods. A road corridor from Kake (forest road 6930) allows access to a small segment of the southern portion of the analysis area. Vehicles using this road come predominantly from Kake.

Recreation

Three concepts are used to describe recreation: (1) the **Recreation Opportunity Spectrum (ROS)** was used to inventory and measure changes to the overall recreation setting, (2) **recreation places** refers to both known and potential recreation areas, and to areas where concentrated use outside of developed areas occurs and (3) **existing use and potential demand** is to be used to forecast changes resulting from management actions.

ROS

ROS is a conceptual tool to describe opportunities for activities by looking at the settings that provide these opportunities. Settings range from "urban" to "primitive". Seven classes are considered for inventory and descriptive purposes; five of these are contained in the Bohemia Mountain analysis area.

The analysis area is mainly in a "primitive" setting. This covers an area west of Portage Bay, over Bohemia Mountain, and extending into the vast muskeg flats on the west side of the analysis area. As one moves away from this core, a transition into "semi-primitive nonmotorized", then "semi-primitive motorized" setting is encountered, with "semi-primitive motorized" constituting the shoreline against Frederick Sound and the west side of Portage Bay. Forest Development Road 6030 from Kake provides a "roaded natural" setting. Since roads, harvest units, and developments exist, the east side of Portage Bay is inventoried "roaded modified."

Table 3-7.A Summary of ROS Settings in the Bohemia Mountain Analysis Area.

Classification	Acres
Primitive (P)	32,604
Semi-Primitive Nonmotorized (SPNM)	21,656
Semi-Primitive Motorized (SPM)	10,346
Roaded Natural (RN)	681
Roaded Modified (RM)	2,402
Total	67,689

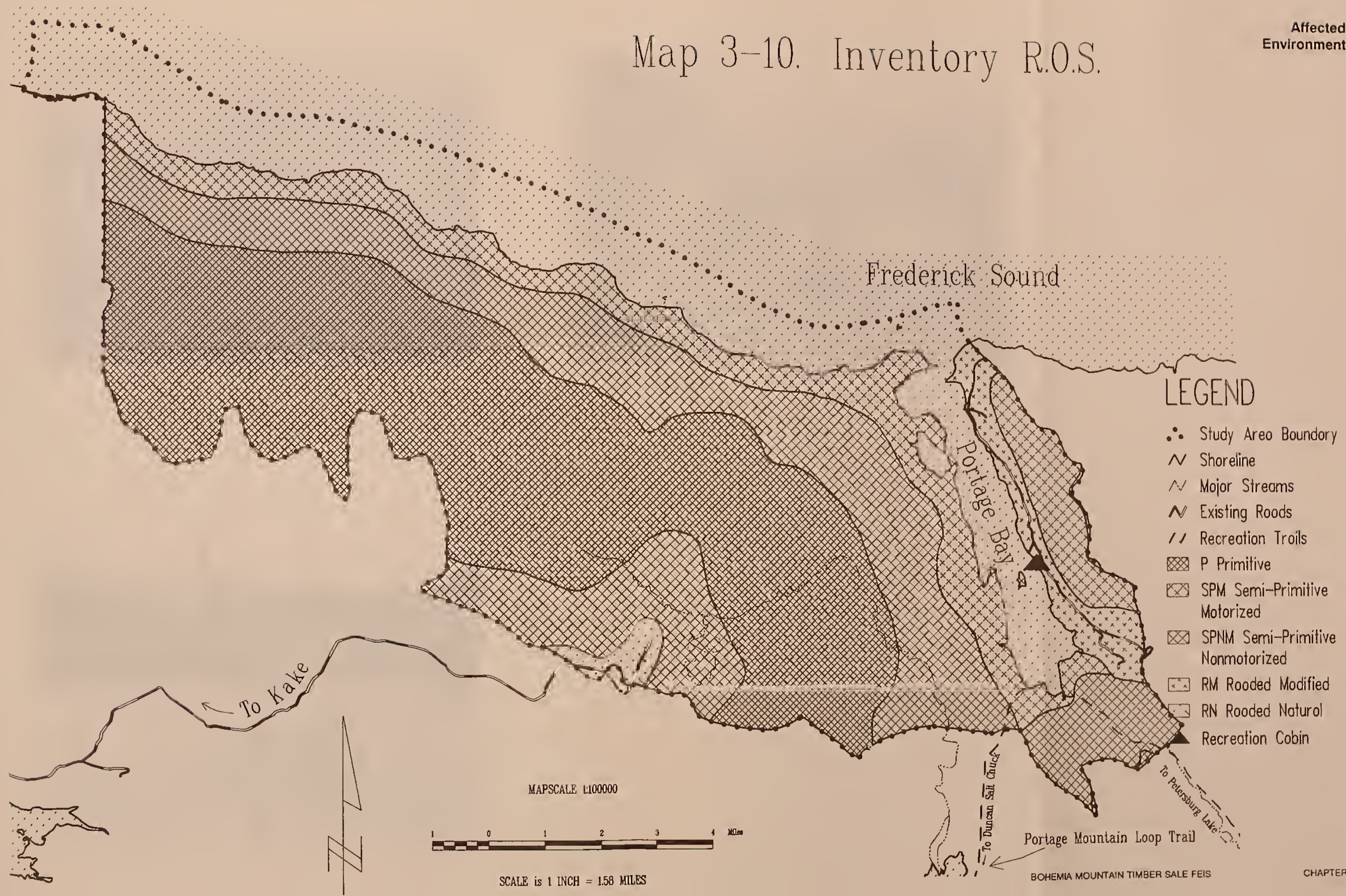
Recreation Places

Recreation places were developed and used for the forest plan revision process. Besides inventorying existing sites and those that could be developed, it provides a process for identifying and inventorying important dispersed areas. An attractor like fishing, beachcombing, solitude, remoteness, or a combination of these attractors could exist in undeveloped areas and attract recreationists.

Recreation places outside of the analysis area can be affected by activities within the analysis area, depending on the attributes of the attractor. For instance, if sights and sounds in the analysis area affect the adjacent Wilderness, the qualities and attributes which attract recreationists to those recreation places, such as solitude and remoteness, could change, possibly resulting in different activities, social conditions, and users. Likewise, drastic setting changes may have little impact on the attractor of a place. For instance, a good fishing spot may attract use, whether it be in a developed setting or a natural setting.

Nine recreation places are located either partially or totally in the analysis area. Two of these comprise the area at the end of the 6030 road. One consists of activities facilitated by road access, such as driving and gathering forest products, and the other is associated with informal hiking and use of Bohemia Lake. The northwest corner of the analysis area adjacent to Frederick Sound contains one place used for stream fishing and dispersed camping.

Map 3-10. Inventory R.O.S.



Recreation Places (continued)

The majority of recreation places exist in the Portage Bay vicinity. Two of these just inside of the entrance to the bay provide anchorages and boating opportunities. Two at the south end of the bay provide hunting and hiking. One of these includes overnight opportunities at the Portage Bay cabin. Two recreation places just beyond the bay area provide the continuation of hiking opportunities into the Wilderness, via the Portage Mountain loop trail, with options to Petersburg Lake or to the head of Duncan Salt Chuck.

Table 3-8. A summary of recreation places in the Bohemia Mountain analysis area.

Recreation Site	ROS*	Recreation Opportunities
Frederick Sound	SPM	Stream fishing, dispersed camping
6030 Road End	RN	Hiking, road travel, gathering forest products, potential trailheads for Bohemia Lake.
Bohemia Lake	SPNM	Hiking, picnicing, potential trails and developments such as picnic tables, shelters.
NW Portage Bay	SPM	Boat use, two anchorages, recreation residence.
NE Portage Bay	RM	Boat use, two anchorages, boat dock at LTF.
SE Portage Bay	RM	Hunting waterfowl and bear, Portage Bay cabin.
S/SW Portage Bay	SPM	Hunting waterfowl and bear, hiking and two trailheads.
SW of Portage Bay	SPNM	Hiking (Petersburg Creek-Duncan Salt Chuck (PCDSC) Wilderness, Duncan Canal access), viewing scenery.
SE of Portage Bay	SPNM	Hiking (PCDSC Wilderness, Petersburg Lake access)

*(P)Primitive; (SPNM)Semi-Primitive Nonmotorized; (SPM)Semi-Primitive Motorized; (RN)Roaded Natural; (RM)Roaded Modified

Primary developed sites in the area are the Portage Bay cabin and the Portage Mountain loop trail. The cabin, originally constructed as an administrative site, sleeps six and is equipped with an oil stove. It is identified in the Petersburg Recreation Plan and Regional Capital Investment program for replacement and relocation. This move is due to its nonstandard design, age and condition, limited access dependent on high tide, and fair weather anchorage. The new location would likely be in Portage Bay. It is currently in a "roaded modified" ROS setting.

Recreation Places (continued)

The Portage Mountain Loop Trail, #535, has two distinct segments. Segment one extends from Petersburg Lake to Portage Bay, a distance of about 5¼ miles, of which about 3¼ are in the Wilderness. Segment two goes from Portage Bay to the Duncan Salt Chuck at the head of Duncan Canal, where it ties in with the Salt Chuck East public recreation cabin. This distance is about 4¼ miles, of which about 3¼ are in the Wilderness. About one mile of this trail is a beach area in Portage Bay which ties the two segments together, for a total trail length of about 10½ miles. All of this trail is within the "primitive" and "semi-primitive" ROS classes (P, SPNM, SPM). Both trail segments are maintained in a primitive condition, which generally involves periodic brushing and blazing of the route.

Extended loop hiking activities could be provided if this trail were to be extended easterly from the Salt Chuck East cabin. Few of these lengthy hikes exist in the region. Two main options exist: (1) tie back into Petersburg Lake, keeping the extension within Wilderness and (2) continue up Duncan Creek to Wrangell Narrows. About a third of this extension would be in Wilderness, another third in LUD IV land allocation, and the final third in state land along Coho Creek. Other options and side trips are possible and could provide extended hiking opportunities and tie in with existing cabins.

The Petersburg Creek-Duncan Salt Chuck Wilderness is not within the analysis area, but may show the effects of activities occurring there. A complete description of the Wilderness can be found in the "Analysis of the Management Situation" for the Tongass Land Management Plan Revision. This 46,777-acre wilderness was established in 1980, under ANILCA.

Activities present include fishing, hunting, hiking, boating, nature study and camping. The area provides good opportunities for solitude and primitive recreation, and a high degree of natural integrity and apparent naturalness. Few issues, other than aircraft overflights through the valley, have surfaced in previous public scoping efforts or recent internal surveys. Fish enhancement projects and increased use from the east side are potential issues.

Use and Demand

There is no road access for many of these recreation places, and thus boat access becomes an important factor. Gaining boat access involves considerations about distance from population centers, boat size, and exposure and openness of a body of water. Portage Bay is one of few protected waters off Frederick Sound and is important from a recreation and boater safety perspective.

Generally, recreation use in the analysis area is considered relatively light. Road 6030 provides access from Kake, which is served by the Alaska Marine Highway. The north portion of the analysis area is accessible by boat from Frederick Sound. Portage Bay does provide some protected waters and access, although the south end of the bay is only accessible under certain high tide conditions. Trails from the wilderness provide walking access to the southern portion of the area.

Road 6030 from Kake receives light traffic, and field personnel observed a minor increase in public use around the Bohemia Lake area. Bohemia Lake has several gravelly beaches, a unique feature not found in the lakes closer to Kake. During the development of the Petersburg District Recreation Plan, several comments were made concerning use and potential opportunities of this area. However, other opportunities closer to the community were a higher priority. The community of Kake is currently looking at options for economic diversity. These include guide and outfitting businesses along with other types of tourism, which could result in increasing demand for recreation opportunities in the Bohemia Analysis Area.

The Portage Bay area receives relatively moderate recreation use due to its proximity to Petersburg and the protection it provides. Motorcyclists, bikers, ATV users, and hikers all use the road system. Use of the Portage Bay cabin ranged from 18 to 24 nights per season over the past few years and occurs in the spring, summer, and fall.

Portage Mountain trail is lightly used within the analysis area with slight day-use increase around cabin areas. Use of the entire trail in one outing is estimated to be from no use to 20 users per season.

The City of Kupreanof has expressed interest in these trails. They believe the trails could provide extended hiking opportunities that would encourage such cottage industries as bed and breakfast inns, outfitting and guiding services, backpacking organizations, and transportation services. They believe expansion of the trail system could be an important factor in drawing visitors to their area, though, at this point, no known plans exist to provide these services. Further development of the trail opportunities in this area was not identified in the recent Petersburg Recreation Plan. However, general statements on the need for extended hiking opportunities and for better trail maintenance in the area were mentioned by the public several times. These public suggestions are consistent with general Forest Service policy and draft Forest Plan Revision direction, which emphasizes loops, proximity to communities, and extended opportunities.

Wild and Scenic Rivers

Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act requires that all federal land management agencies identify rivers with outstandingly remarkable values and decide which will be recommended to Congress for designation as Wild and Scenic Rivers. Designation is a four step process: (1) the agency identifies streams or stream segments with outstandingly remarkable values; (2) the agency classifies each eligible stream into one of three categories, wild, scenic, or recreational; (3) the agency evaluates the effects of designating each eligible river and selects the rivers that are suitable for recommendation to Congress; and (4) Congress designates rivers for inclusion in the National Wild and Scenic River System.

Tongass Forest Plan Revision

During the Spring of 1990, the Forest Service identified 112 rivers on the Tongass as tentatively eligible for designation as either wild, scenic, or recreational classification. The eligible rivers will be examined for suitability in the Forest Plan Revision process currently underway. Each Revision alternative includes a different mix of river segments that will become suitable if that alternative is selected. The analysis evaluates the gains or losses to all resources if Congress were to designate the river. Each alternative also includes interim management prescriptions for each suitable river to protect the outstandingly remarkable values until designation occurs. The rivers in the selected alternative are then recommended to Congress for designation.

Bohemia Mountain Analysis Area

Duncan Salt Chuck Creek was one of the 112 rivers tentatively eligible for further consideration as a potential addition to the National Wild and Scenic River System. This stream originates within the analysis area and will likely have to be crossed by one or more roads should a timber sale be conducted in the area. This stream was initially considered in the current revision of the Tongass Land Management Plan and was not recommended in the Regional Forester's preferred alternative identified in the Draft EIS for the revised Plan. Since the final revised Plan may not be completed until 1992 and the Bohemia Mountain timber sale is proposed for sale prior to that time, further assessment of the suitability for designation of this stream will be conducted as part of the timber sale analysis. A copy of the suitability study has been incorporated into this Draft EIS (Appendix E). No other streams in the analysis area were identified as eligible for designation.

Cultural Resources

Cultural resources include the evidence of past human activity, potentially dating from the first occupation of southeast Alaska to the recent past. Information on the prehistory of the region is limited and that of Kupreanof Island is poor. Sources include "A Cultural Resource Overview of the Tongass National Forest" (Arndt, et al. 1987) and "Raven's Wrinkled Foot: A Cultural Resources Overview of Kupreanof Island, Southeast Alaska" (Campbell 1988).

Kupreanof Island was once occupied exclusively by two Tlingit groups, the Kakekwan and the Stikinekwan. The line of division was reported to have run roughly north and south through Kupreanof Island, from Portage Bay on the north to a midway point between Point Barrie and Totem Bay on the south. The Kakekwan controlled west of the division line, while the Stikinekwan controlled the area to the east. At the time of Euroamerican contact, the Kakekwan Tlingit was comprised of at least nine clans, while at least five Stikinekwan Tlingit clans used various portions of eastern Kupreanof Island. Each clan owned tangible property, such as salmon streams, berry patches, offshore waters for hunting sea mammals and bottom fish, and both winter and summer homes; as well as intangible property including crests, house and personal names, songs, and origin myths.

European discovery of Portage Bay was made in August 1794, by a survey party from Vancouver's expedition, but made no mention of aboriginal sites. The placename originated from the Russians who explored the bay in the late 1840's. An 1848 Russian nautical chart (Russian Hydrographic Department Chart 1396) reveals the name of Perenosnaia Bhutka, which translates as Portage Bay. The name apparently refers to Tlingit use of a canoe portage trail connecting Portage Bay with Duncan Canal to the south. In 1869, it was called Perenosnaia Creek by Commander R.W. Meade of the U.S. Navy. The *Coast Pilot* of 1883, indicates Portage Bay..."is well adapted for steamers, and is considered an excellent anchorage notwithstanding its narrow entrance, as it has no channel dangers. The regular rounds of Russian Company trading vessels included a visit to this harbor."

Historic period sites (at least 50 years old) may include commercial fish processing sites, cabins, camps, fur farms, logging, animal trapping, and mineral exploration. Several historic mining sites were identified at the head of Duncan Canal, south of the analysis area. None of the claims were extensively developed. Commercial logging began on Kupreanof Island by 1913, and continues today. Several early logging operations were based in Portage Bay.

Reconnaissance and complete cultural resource inventories have been completed for various Forest Service activities on Kupreanof Island, including several within the analysis area. This information is filed in the Stikine Area Supervisor's Office, but is generally not available to the public because of the sensitivity of the sites. A 1975 archeological and historical inventory of the region conducted by Sealaska Corporation identified no historic or cemetery sites within the analysis area.

A total of six cultural sites, five historic and one aboriginal, are currently listed on the Alaska Heritage Resource Survey (AHRS) for the Bohemia Mountain area. Three aboriginal sites and one historic special use permit site have been reported but not verified.

Visual Resource

Landscape Character

The landscape of the Bohemia analysis area is common to the Kupreanof Lowlands visual character type. Mountain peaks that would appear ordinary in other areas are more visually significant here because of the expansive adjacent lowlands. The Bohemia and Missionary Ranges are the most visually prominent landforms within the analysis area and attract viewer attention, as well as being the most prominent landforms along most of the north shoreline of Kupreanof Island. Both ranges offer little visual variety. They are evenly timbered and few alpine openings are apparent within the analysis area boundary, although alpine is common immediately eastward.

Sensitive Viewpoints

The analysis area is viewed predominantly from Frederick Sound to the north, a highly sensitive travel route due to its heavy recreational and commercial use. Ferry boats and small cruise ships view the area as middleground and background (½ to 5+ miles), and commercial and sports fishermen often troll or jig within the foreground distance zone (½ mile or closer).

Portage Bay is considered a highly sensitive route due to its frequent recreational use by both local residents and small groups of tourists. Foreground scenery within Portage Bay consists of shoreline timber; the Missionary Range and low elevation knobs to the west are viewed as middleground. The Bohemia Range is viewed in the far middleground.

A seldom used hiking trail passing from Petersburg Lake to Portage Bay to Duncan Salt Chuck (Portage Mountain Loop Trail) offers views through muskeg openings to portions of the analysis area not seen from saltwater.

Seen Area

Approximately 34 percent of the Bohemia Mountain analysis area is seen from sensitive viewpoints (see Map 3-9). Of this seen area, approximately 36 percent is land that has already been harvested (managed stands) or is scheduled for harvest (operable CFL) under the current Forest Plan. To a casual observer, roughly 4 percent of this seen area actually appears harvested; several older managed stands are no longer considered obvious openings. (This figure represents actual acres harvested, not adjacent unharvested areas that are visually affected by harvest.)

Approximately 40 percent of the available commercial forest land (CFL) in this analysis area is seen from nearby travel routes. Broken down by VCU; 80 percent of the operable CFL in the Portage Bay VCU (442) is seen, and 30 percent of the operable CFL in the Bohemia Mountain VCU (424) is seen.

Visual Quality Objectives (VQO's)

VQO's are standards for managing visual change in the landscape. They suggest varying degrees of acceptable modification based on viewing distance, landscape character, and viewer interest in scenic quality. In areas of high scenic quality and high viewer interest, VQO's of "partial retention" and "retention" suggest managing for little or no visible change in the landscape. VQO's of "modification" and "maximum modification" indicate the area is rarely seen or is relatively low in scenic value, and change would not be noticeable or of great social consequence.

The VQO's described below and displayed in Map 3-10 represent the current "inventory" of desired objectives, given only visual resource management concerns. These inventory VQO's may or may not be met by the selected alternative. Selection of the preferred alternative involves consideration of all resource concerns for an area and includes the decision of whether or not to meet inventory VQO's.

Sixty-nine percent of the landscape seen from saltwater has a VQO of "partial retention." Under a partial retention objective, management activities may be evident but should remain subordinate to the characteristic landscape. Natural forms and patterns should remain dominant.

The landscape seen as foreground along the Portage Bay shoreline (8 percent of the seen area) is mapped as "retention" VQO. Under the "retention" objective, management activities may take place but should not be obvious to a casual observer. The north Kupreanof shoreline is a "partial retention" VQO, as it is seen in middleground from the ferry lane.

The remaining 23 percent of the seen area, including the foreground of the Portage Mountain Loop Trail, has been assigned a "modification" VQO. This objective allows management activities to dominate the characteristic landscape, but these activities should appear as a natural occurrence when viewed in the foreground or middleground.

Of the nonseen area, 10 percent has been given a "modification" VQO, and 90 percent a "maximum modification" VQO. The difference in VQO designation is due to changes in landscape character. Under a "maximum modification" objective, management activities may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

Visual Management Classes (VMC's)

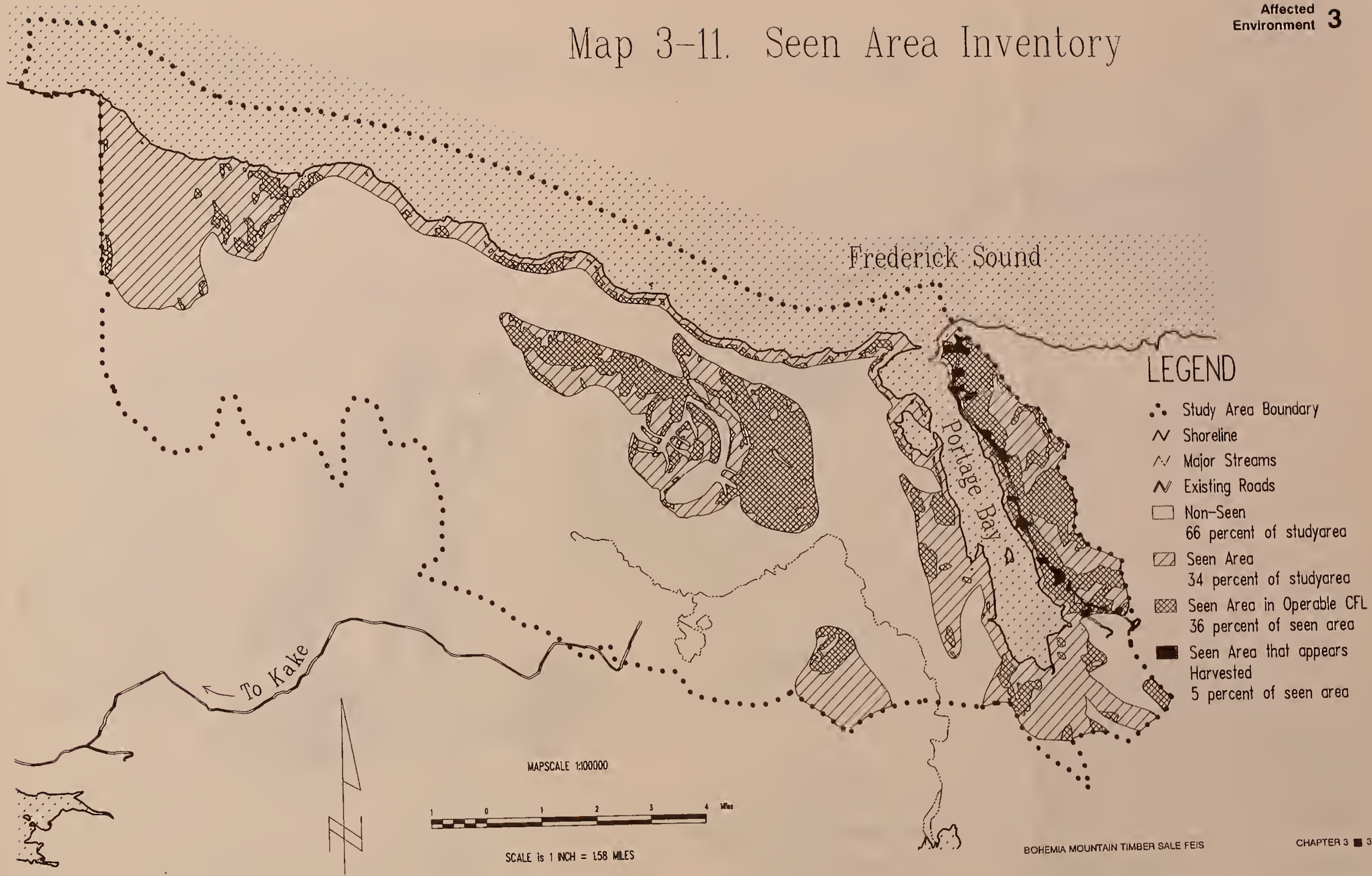
Visual Management Classes identify areas where greater care may be needed in designing management activities to be consistent with VQO's. VMC's combine VQO and terrain data (such as percent slope) to identify the relative ease with which VQO's may be met given certain ground conditions. For example, an area with VQO's of "retention" or "partial retention", combined with steep, evenly-timbered slopes will often result in a higher cost of doing business, or a compromise of scenic quality, or perhaps both.

Map 3-11 identifies VMC's for the analysis area. Approximately 23 percent of the entire analysis area, 67 percent of the seen area, is mapped as VMC's 1 and 2, the most sensitive. Proposed activities which overlap these VMC's will need extra attention during project design and layout. VMC's 3 and 4 indicate areas where inventory VQO's will be easier to meet or where management activities are not likely to be seen.

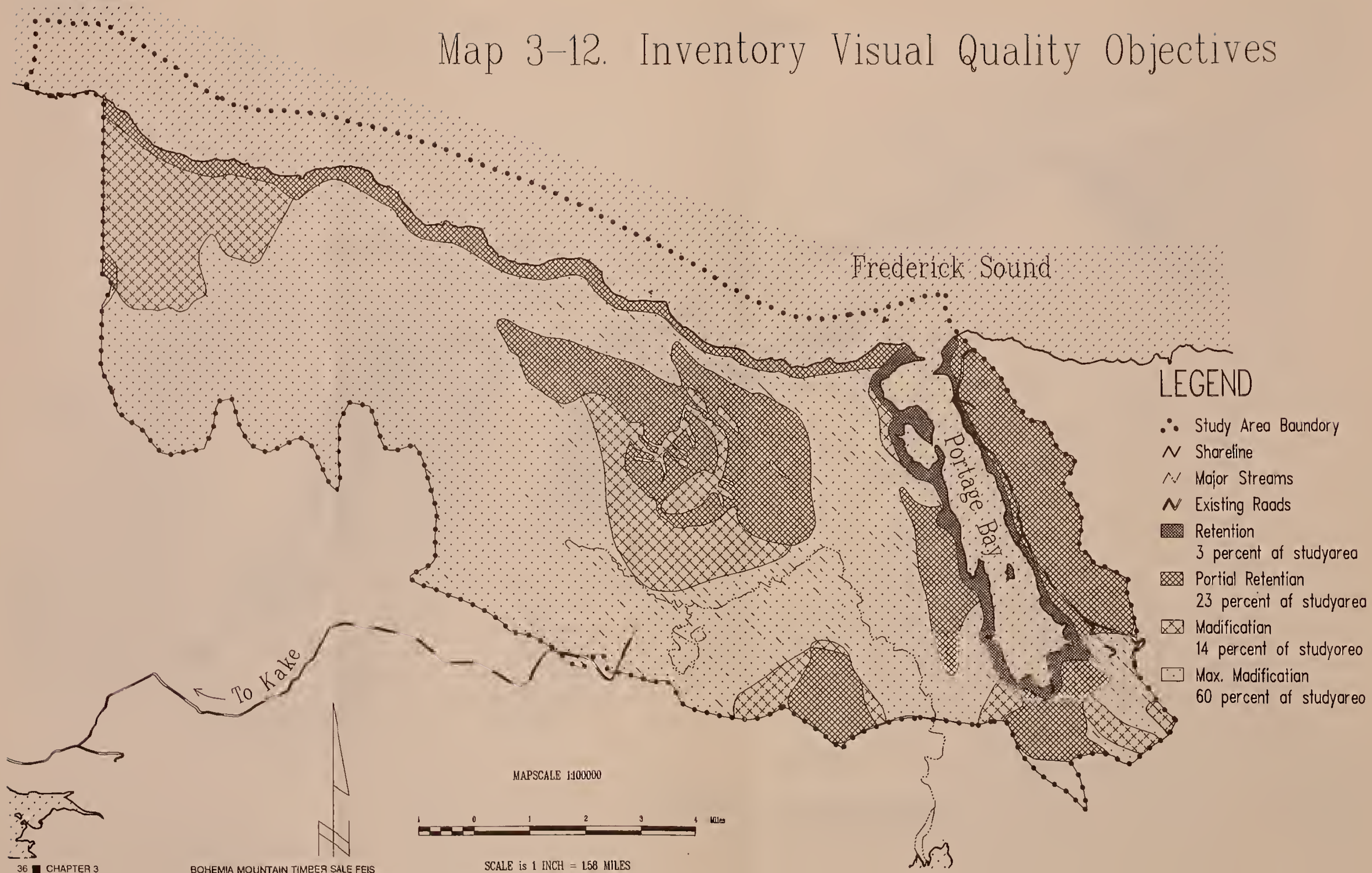
Existing Visual Condition (EVC)

Related to the question of how easily change may be incorporated into the landscape is the question of what has happened there already. Previous change can make additional change less noticeable if activities were well designed. If they were not well fitted to the landscape, previous activities may prompt a negative reaction to additional change. Site modification both within and outside the analysis area must be considered when estimating cumulative effects.

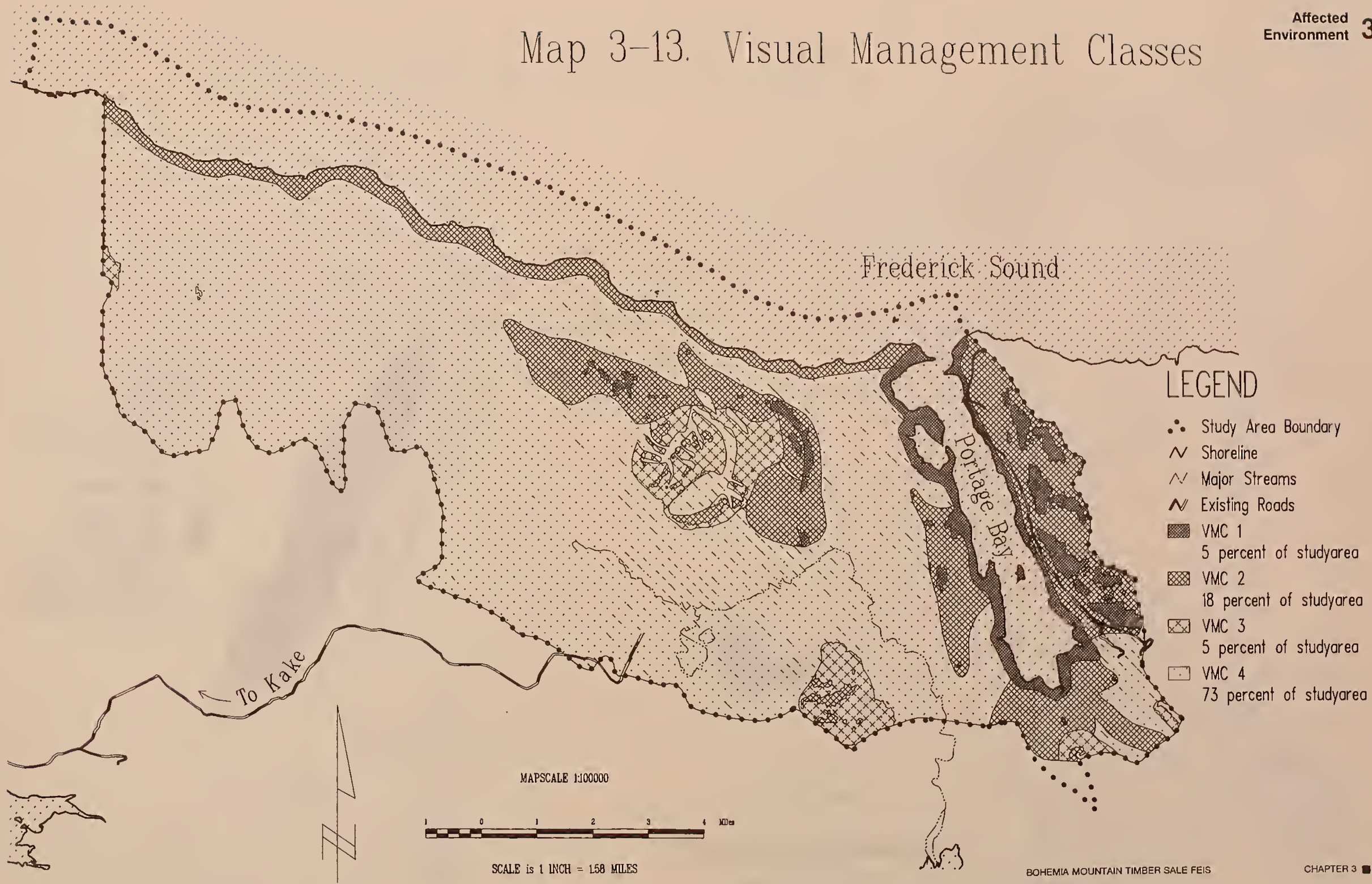
Map 3-11. Seen Area Inventory



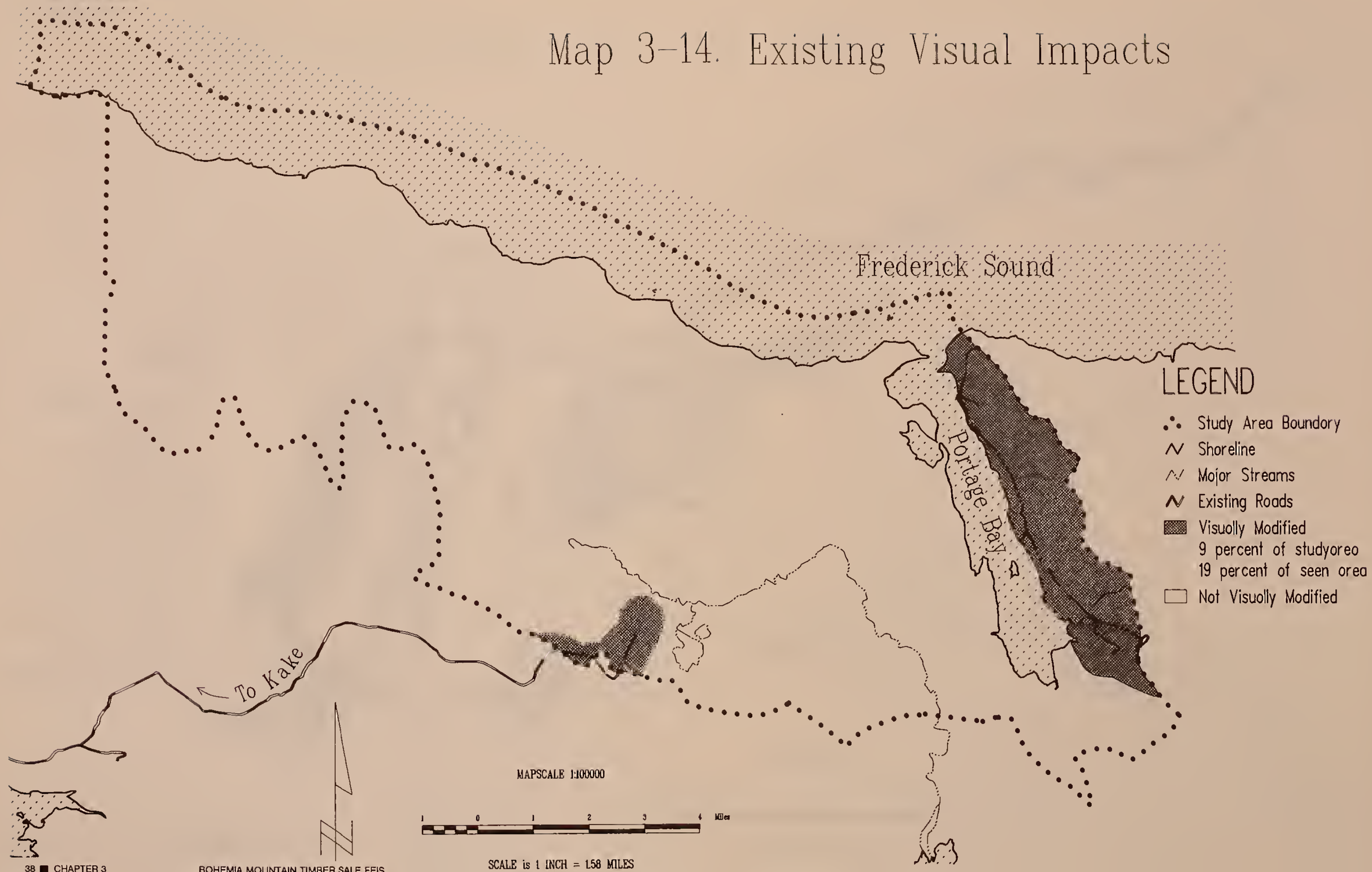
Map 3-12. Inventory Visual Quality Objectives



Map 3-13. Visual Management Classes



Map 3-14. Existing Visual Impacts



Map 3-12 shows generally where past management activities are still visible within the analysis area. Currently, timber management activities have altered approximately 9 percent of the entire analysis area and 19 percent of the seen area. These activities have focused primarily on the east side of Portage Bay. Other visual impacts include the private recreation cabin on Hook Point, and Forest Road 6030 (white rock road). (These figures include the adjacent lands that are visually affected by actual modifications; an entire drainage may appear modified because of a clearcut along the bottom.) Cumulative effects are likely to be greatest in areas where existing modifications overlap with more sensitive VMC's 1 and 2 and with proposed new activities.

Outside the analysis area, a boater on Frederick Sound will encounter several managed stands in the nearby area. From Petersburg, the Twelvemile and Todahl sale areas can be seen prior to arriving at the Bohemia Mountain analysis area. Between Kake and Bohemia Mountain, large areas of managed Native lands can be seen.

Forest Plan Direction

The current Forest Plan, amended in the winter 1985-86, directs that "VQO's will range from 'partial retention' to 'maximum modification,' with the higher quality objectives being applied on those lands viewed from the ferry lane in Frederick Sound." This is interpreted to mean that land viewed from the Frederick Sound ferry lane will be of primary concern, and will receive a "partial retention" VQO with some areas of "modification." Lands seen from Portage Bay have been inventoried as "partial retention," but will receive secondary consideration if compromises are necessary during the project planning phase. This may mean a visual appearance of "modification" would result as seen from Portage Bay.

Minerals

There are no known existing mining claims in the Bohemia Mountain analysis area. One patented claim exists outside the analysis area adjacent to the Petersburg Creek-Duncan Salt Chuck wilderness boundary which would not be affected by any proposed activity. Mineral potential may exist and it is possible that prospecting might occur if roads are built.

Lands

All lands within the analysis area are National Forest System Lands. There is one private recreation cabin in Portage Bay, authorized by special use permit. There is a logging camp site and log transfer facility in Portage Bay.

Vegetation

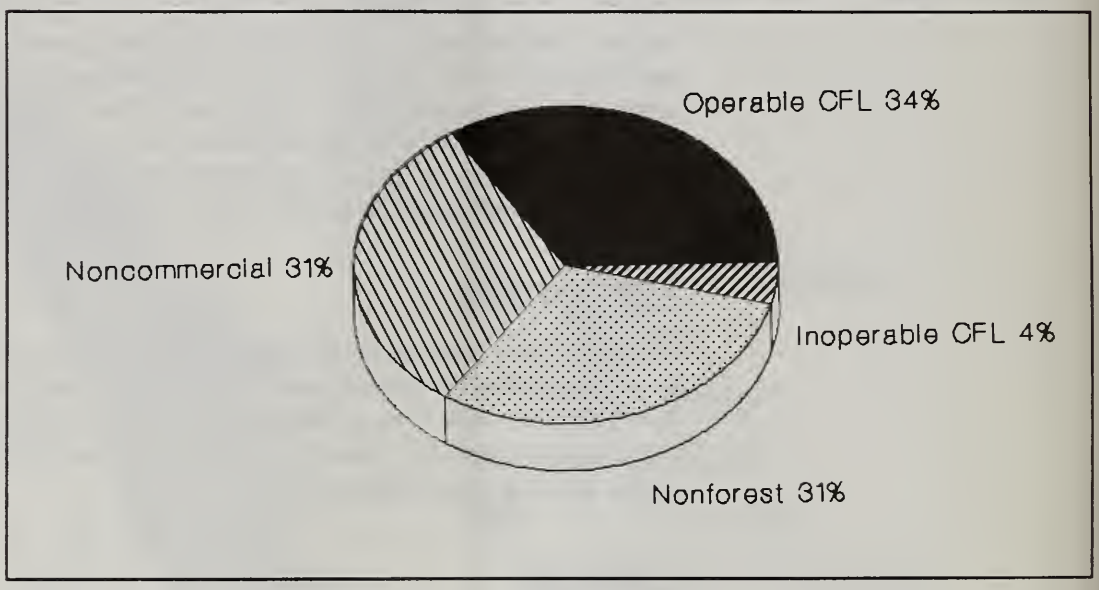
The Bohemia Mountain analysis area lies in the coastal temperate rain forest. A detailed description of the timber and vegetation characteristics is available in the *Southeast Alaska Area Guide*, the *Forest Ecosystem of Southeast Alaska (volumes 7 and 9), Preliminary Forest Plant Associations of the Stikine Area*, and the *Final Environmental Impact Statement* for the Tongass Land Management Plan.

No threatened or endangered plant species are known to exist in the analysis area, although information on minor species is limited.

Marsh Marigold

The Bohemia Mountain analysis area is composed of approximately 20,663 acres of nonforested land and 47,025 acres of forested land. Of this forested land, approximately 21,185 acres are noncommercial forest and 25,840 acres are commercial forest. The commercial forest land (CFL) consists of approximately 2,970 acres of inoperable CFL which is not available for timber harvest and approximately 22,870 acres of operable CFL suitable for harvest. The operable CFL is comprised of approximately 16,725 acres of normal CFL and 5,515 acres of nonstandard CFL. Inoperable CFL are those stands which, if harvested, would have a high potential for resource damage, or stands whose physical limitations make harvest of trees uneconomical or impractical. The primary difference between normal operable and nonstandard operable CFL is that normal stands have less potential for erosion and slope failure than nonstandard stands. Normal operable stands may be logged using common harvest systems such as high lead, short-span skyline, or track loaders. Nonstandard operable stands require special yarding systems which result in less impact on soils, such as long-span skyline or helicopter logging.

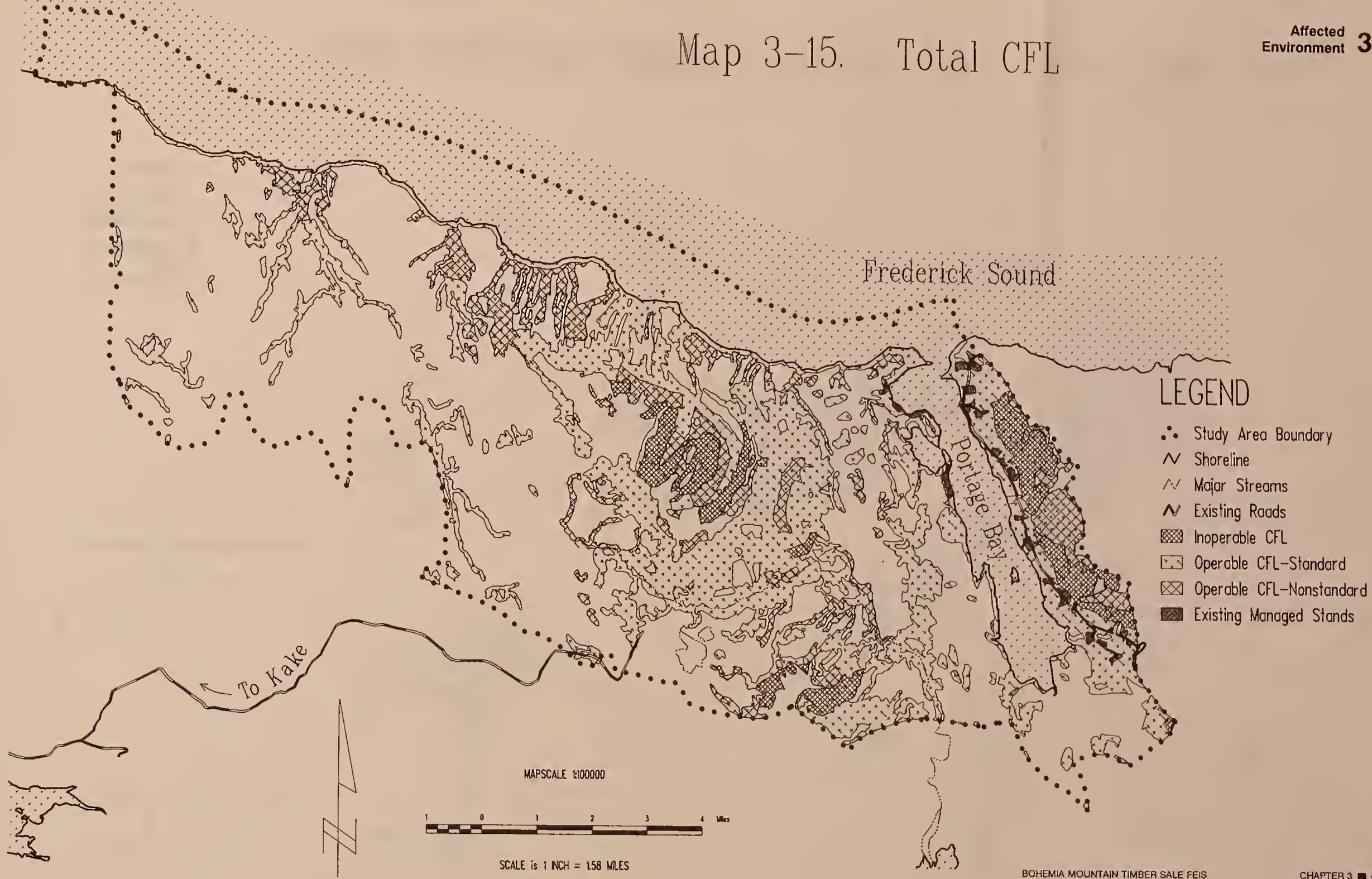
Figure 3-2. Bohemia Mountain Analysis Area Land Base.



The Bohemia area has a high percentage of poorly drained, low-productive sites which cannot grow commercially valuable trees. The remaining commercial forest productivity is generally moderate. The low- to moderately-productive growing sites produce low- to medium-volume timber stands. Higher volume stands are located on the better-drained sites along the streams and on the steeper mountain slopes while the lower volume stands occur on the poorly drained sites at higher elevations. Site index and volume class are used to measure site productivity.

Readers who refer to the Forest Plan Administrative Record will find that the Forest Plan inventory for the Bohemia Mountain analysis area does not agree with the figures used in this EIS (see Table 3-9). The figures in the Forest Plan were based on the analysis of photo points from aerial photographs. The figures in this EIS were developed from a more recent and detailed inventory which was put into a computerized database. The newer database is considered to be more accurate for project level planning in the Bohemia Mountain analysis area.

Map 3-15. Total CFL



Map 3–16. Past Activity on North Kupreanof Island

Table 3-9. Comparison of Volume Classes in Forest Plan Inventory and Bohemia Mountain Analysis Area by Value Comparison Unit (VCU).

VOLUME CLASS Board-Feet/Acre	Forest Plan Operable CFL Acres	Bohemia Mountain EIS Operable CFL Acres
VCU 424		
8-20,000	5,684	9,214
20-30,000	2,916	5,911
30-50,000	673	1,262
50,000+	75	0
Total	9,348	16,387
VCU 441.1		
8-20,000	N/A	325
20-30,000	N/A	699
30-50,000	N/A	263
Total	0	1,288
VCU 442		
8-20,000	2,219	1,608
20-30,000	1,405	2,151
30-50,000	814	1,436
Total	4,438	5,195
TOTAL	13,786	*22,870

*This total includes the 9,131 acres of .7 HSI wildlife habitat that will be deferred from harvest at this entry.

Approximately 11 percent of the commercial forest land is volume class 6 (30-50 MBF per acre), 42 percent is volume class 5 (20-30 MBF per acre), and 47 percent is in volume class 4 (8-20 MBF per acre). The analysis area has no volume class 7 (50 + MBF per acre). Table 3-10 displays the volume class distribution of the operable commercial forest land by acreage.

Table 3-10. Bohemia Mountain Analysis Area Volume Class Distribution by Acres.

Volume Class	Board Feet Per Acre	Commercial Forest Land Acres (%)	Operable CFL Acres (%)
4	8-20,000	11,982 (46)	11,148 (49)
5	20-30,000	10,897 (43)	8,760 (38)
6	30-50,000	2,961 (11)	2,961 (13)
7	50,000+	0 (0)	0 (0)

Alaska Cedar

Commercial forest species on the area include Sitka spruce, western hemlock, Alaska cedar, and mountain hemlock. Noncommercial forest species include lodgepole pine and alder.

The commercial forest stands on the area occur predominantly as uneven-aged and over-mature stands. A minor component of the commercial forest exists as even-aged stands of varying ages which originated from timber harvest or from catastrophic windstorms.

The older aged commercial stands have an average species composition which varies between volume classes and which consists of approximately 77 percent hemlock, 16 percent Sitka spruce, and 7 percent Alaska cedar.

The older aged forest stands are declining in productivity, and wood defect and decay is estimated to be as high as 36 percent of the volume. Dwarf mistletoe is present in most older aged hemlock stands. Much of the Alaska cedar on the area is dying, as is the case generally thoughout southeast Alaska.

Approximately two percent (434 acres) of the operable commercial forest land in the analysis area has been previously harvested and converted to second growth. All of the second growth stands have been certified as adequately stocked, exhibit vigorous growth, and have a stocking range from a well-stocked to overstocked condition.

Tongass Land Management Plan

Land on the Tongass National Forest has been categorized based on its vegetative cover as commercial forest land (CFL), noncommercial forest land, or nonforest using the Tongass Land Management Plan (TLMP) aerial photo point inventory. Acres of CFL in each volume class have been estimated for the analysis area using the Forest Plan aerial photo point inventory and a more recent and intensive set of inventories which included stand examinations, soil surveys, and aerial photo analysis. (See Table 3-10.) TLMP data is statistically accurate for the Tongass National Forest, although the figures become less accurate when broken down by analysis area. An updated inventory of CFL was entered into a computer database and used in this Bohemia analysis. This new inventory is considered to be more accurate for the Bohemia Mountain analysis area than the Forest-wide inventory. (See Table 3-9.)

Employment

The timber and fishing industries provide the majority of all jobs in the primary employment sector in southeast Alaska. In Petersburg, seafood harvesting and processing are the primary employers, followed by Federal, State, and local government, and timber harvesting. Kake is located on the northwestern side of Kupreanof Island, on Keku Straits. The majority of the people earn their living by fishing; logging; educational, health and social services; and transportation, communication and utilities. In Wrangell, timber harvesting and milling are the primary employers, followed by Federal, State, and local government, and seafood harvesting and processing. Alaska Pulp Corporation sawmill is the town's largest employer, and tourism is an emerging industry.

Transportation

Roads

The Bohemia Mountain analysis area has roads connecting it to the village of Kake. Kake, with an estimated population of 600, is located on the northwest end of Kupreanof Island, facing Keku Strait. Air taxis, both float and wheeled, provide scheduled trips to Kake. The Alaska Marine Highway feeder system ferry provides twice-weekly landings in Kake, northbound from Petersburg and southbound to Petersburg.

The analysis area also has an isolated road system that originates at the log transfer facility and logging camp in Portage Bay and provides access to the Todahl Creek area northeast of Portage Bay, the eastern side of Portage Bay, and the Portage Creek/Twelve-mile Creek drainages southeast of Portage Bay. Access to this road network is only by boat or sea plane. Currently, the Kake and Portage road systems are not connected.

There are close to 90 miles of existing Forest Development Road (FDR) in the Kake transportation network and nearly 50 miles of existing FDR in the Portage Bay network. Within the analysis area there are 10.5 miles of the Kake network and 7.5 miles of the Portage network.

Log Transfer Facilities

There are two existing log transfer facilities (LTF) which can provide access to saltwater for timber harvested from the analysis area. Either or both sites may be used for this project.

The Little Hamilton LTF is located approximately 10 miles south of Kake outside the analysis area. Nearly 175 million board feet of timber has previously been transferred into the water over this LTF, and it is currently available for use. In 1983 this facility was reconstructed from a log bulkhead to a concrete pile supported dock facility, designed for A-frame or crane lift-off which provides a controlled, non-violent entry of logs into the water. The current design is limited to handling small volumes of timber. Any significant increase in volume of timber going through the LTF will require additional redesign and reconstruction. The current permits for this LTF are valid until December 2017.

The Portage Bay LTF was constructed in 1982 as a log "beaver slide" and was reconstructed in 1986 as an endless chain conveyor system which provides gentle entry of logs into the water. This facility also includes an airplane float and ramp. Nearly 80 million board feet of timber have passed through this facility, and it is currently an active LTF. Although dual operator use of this LTF has not occurred, it is considered feasible for two operators to water logs from two sales at this facility simultaneously.

Logging Camps

There are logging camps located at both Portage Bay and near Kake. The Kake camp is located on Forest Highway 40, about three miles south of Kake, and provides room for 40 people. The Portage Bay camp is located approximately three miles south of the LTF and is designed to accommodate 80 people.

Administrative Sites

Forest Service Administrative facilities to house workers are located at Kake (11 workers) and Portage Bay (16 workers).

Other Past or Planned Activities In the Surrounding Area

A number of projects have occurred, are currently in progress, or are proposed for the near future on nearby National Forest System lands on Kupreanof Island. Although the projects may not directly affect the Bohemia Mountain Timber Sale, they are discussed here in order to provide a more complete context within which that sale is being considered.

Portage-Twelve Mile Timber Sale
In April 1975, a timber sale was offered in the Portage-Twelve Mile area. A total of 48.73 MMBF of timber was harvested on 2,327 acres in 37 units. Seventy-two acres were cleared for roads and ten acres for a logging camp, for a total of 2,409 acres. Three miles of road were reconstructed and 19.2 miles of new road were constructed. This sale was never sold as an independent sale, but was sold as substitute volume under the Alaska Lumber & Pulp Co. long-term contract during the 1976-81 operating period. Harvesting was completed in 1984.

Hamilton Creek South Timber Sale
An Environmental Assessment was completed in June 1975, and the sale was offered as an independent sale four times and never sold. It was offered in March 1976 with 31.6 MMBF; December 1976 with 31.2 MMBF; March 1977 with 23.69 MMBF; and August 1977 with 23.69 MMBF. This timber was eventually incorporated into the Alaska Lumber & Pulp Co. long-term contract as substitute volume when some land under contract near Hoonah became unavailable. This substitute volume was harvested by Virgil Soderberg from 1976 to 1981. Total volume harvested was approximately 31.6 MMBF and 0.4 miles of temporary road were constructed.

Tonka Mountain Timber Sale
This sale, awarded in December 1978, is currently being harvested and will terminate on May 31, 1991. This sale was designed to harvest 55.5 MMBF consisting of 35 clearcut units totalling 1,692 acres and two partial cut units totaling 347 acres. Thirty-two miles of Forest Development roads were constructed and approximately 14.42 miles of temporary road will be constructed.

North Irish Creek Timber Sale
An EIS was completed in March 1977, and the sale, awarded in 1980, is currently being harvested. It is scheduled for completion by May 31, 1993. This sale was designed to harvest approximately 47.18 MMBF of timber in 31 clearcut units totalling 1,775 acres and to construct 39 miles of Forest development roads, clearing an additional 93 acres.

Bohemia Timber Sale
An Environmental Assessment (EA) was completed in December 1982, documenting a sale to harvest 24.1 MMBF of timber in 18 clearcut units and construct 28.9 miles of road. This sale never sold. However, three of the units from this sale are now part of the "Combination Timber Sale" currently being harvested.

Todahl Timber Sale
An EA was completed in April 1983, and the sale was harvested from 1983 through 1990. There are 26 clearcut units totalling 1,081 acres and containing approximately 36.16 MMBF. Sixty-seven acres were cleared for 17.1 miles of specified road and 2.7 miles of temporary road.

Totem Timber Sale
An EA was completed in April 1984 for this sale on the unroaded south end of Kupreanof Island. Construction of approximately 18.8 miles of road was intended to open the opportunity to harvest 46.67 MMBF of timber on 2,404 acres. One harvest unit, reviewed and approved by the Regional Forester, is designed to be 430 acres in size. This sale never sold and the environmenal document will likely need to be revised before a sale in this area can be offered.

Toncan Timber Sale
An EA was completed in September 1984. Twenty-two clearcut units totaling 1,501 acres were designed which contain approximately 56.35 MMBF of timber. Approximately 18.65 miles of new road, 7.73 miles of temporary road were constructed, and 2.37 miles were reconstructed, resulting in 37 additional acres cleared. The operator is currently finishing up the sale and the Forest Service is in the process of closing this sale.

Cathedral Timber Sale
An EA was completed in August 1986, but the original sale never sold. It was designed to harvest 9.6 MMBF of timber and construct 5.1 miles of road. This was to be accomplished in a series of small sales.

Pipeline Timber Sale
An EA was completed in December 1986 but was not purchased when offered for sale. All units from this sale were subsequently incorporated into the "Combination Timber Sale," which was sold in September 1989.

Missionary Timber Sale
An EA was completed in May 1989 to harvest approximately 4.5 MMBF of timber from three clearcut units totaling 213 acres in an area previously given access by the "Portage/Twelve-Mile Sale." No new forest development roads will be constructed. This sale was sold in September 1989 and will terminate March 31, 1993.

Combination Timber Sale
This sale, awarded in September 1989 and scheduled for completion on March 31, 1994, is a combination of all the original "Pipeline Timber Sale" units and three of the original "Bohemia Timber Sale" units. It will harvest 590 acres in eight clearcut units and 24 acres along three miles of road for a total of 10.34 MMBF of timber.

Mitkof-Kupreanof Small Timber Sale
This timber salvage planning effort includes proposed harvest units on both Mitkof and Kupreanof Island. Proposed units in the Portage-Twelve Mile area include 2.2 - 3.5 MMBF of timber. Approximately 0.9 miles of temporary road would be built. The environmental assessment for this project is planned to be completed in June 1991. Timber harvest could begin in spring 1992.

Forest Plan Revision

The Tongass National Forest Land Management Plan (the "Forest Plan," or "TLMP") is currently being revised. As part of the revision process, changes in management direction for the Bohemia Mountain analysis area will be considered. Even so, management activities will continue under the direction of the current plan until the revision process is completed. The proposed timber sale is consistent with the current plan direction and is scheduled to be sold prior to the completion of the revised plan.

Chapter 4

Chapter 4

Environmental Consequences

Introduction

This chapter describes the physical, biological, economic, and social effects likely to result from implementing each of the alternatives. A summary of the consequences of each alternative is displayed in Table 2-1 in Chapter 2. This information has been taken from more detailed reports that are available for public review in the planning record, located at the Stikine Area Supervisor's Office, Petersburg, Alaska.

Adverse Environmental Effects Which Cannot Be Avoided

There are some adverse effects which cannot be avoided if one of the action alternatives is selected. Mitigation measures are prescribed to minimize these effects on all alternatives.

Harvest in the Bohemia Mountain analysis area would reduce the number of older-aged stands. As a result, the carrying capacity of the habitat would be reduced for old-growth-dependent species.

Ground disturbing activities such as stream crossings and culvert installation would temporarily increase silt loads in streams and tributaries within the analysis area. In addition, a small loss of fish habitat would occur at road crossings and in those portions of fish habitat occupied by culverts.

Timber harvest and road construction would change the appearance of the landscape. The area where change would be most noticeable is from Frederick Sound along the north shore of Kupreanof Island and in Portage Bay. The effects would diminish as the vegetation grew back.

Short-Term Use Versus Long-Term Productivity

One of the benefits of timber harvest is the increased growth rate of the new trees (regeneration). In older-aged climax stands, annual growth is offset by mortality so that net growth is zero (Hutchison and Labau 1975). In contrast, managed stands will have increased productivity (Taylor 1934). Each action alternative would improve the production of merchantable timber by converting older-aged climax stands to highly productive, even-aged, managed stands. In addition, production of merchantable wood can be further increased if, after the site is harvested and regenerated, the new stands are precommercially thinned.

Irreversible Loss of Resources

An irreversible loss is a permanent or long-term use of a resource that is not replaceable within a lifetime, including the destruction of a cultural site or consumptive use of minerals. In the Bohemia Mountain analysis area, for example, cultural artifacts and cultural sites could be irreversibly disturbed as a result of the timber sale. Subsurface cultural sites that cannot be located with surface surveys are especially vulnerable. The harvest of older-aged timber in the Bohemia Mountain analysis area is considered an irreversible loss because the stands may take 200 to 300 years to develop into older-aged forest. Therefore, the commitment of this renewable resource to timber harvest is reversible only over a long period of time.

Irretrievable Commitment of Resources

An irretrievable commitment is a decision that makes other choices unavailable during the life of the commitment. The decision cannot be retrieved for the time that has already passed but could be changed in the future.

Timber harvest and road construction would irretrievably remove the opportunity to use those parts of the Bohemia Mountain analysis area for primitive, unroaded recreation until the vegetation grows back. The establishment of rock pits is also considered an irretrievable commitment that would reduce or eliminate soil productivity on those sites unless they are rehabilitated. The establishment of buffer strips around eagle nest trees, around cultural sites, and along Class I and II streams (per Tongass Timber Reform Act requirements) makes these buffer areas unavailable for timber harvest and therefore also serves as an example of irretrievable commitment of resources.

Cumulative Effects

The analysis of cumulative effects requires the identification of reasonably foreseeable actions and then the projection, through some reasonable period of time, of the effects of those actions. Reasonable foreseeable actions for this analysis area are interpreted to be those that will occur during Stikine Area's 10-year timber sale schedule. During this time, no harvest activities beyond the Bohemia Mountain Timber Sale are planned.

The cumulative effects analysis utilizes the following assumptions:

- Laws, guidelines, and Best Management Practices (BMP's) for resource protection will be followed.
- Timber sale planning will occur in an interdisciplinary fashion.
- All acres of suitable commercial forest are equally subject to impacts.
- Timber management will rely on even-aged silvicultural techniques.
- The "no action" alternative would represent only a delay in implementing the TLMP and therefore would not affect the assumptions used in the cumulative effects analysis.

Watershed

The exact impacts of a timber harvest and related road building on water quantity and quality are largely a function of complex interrelationships involving many watershed characteristics. The following characteristics allow us to estimate possible risks to watershed, stream, and water quality:

1. The length of stream channels in or near harvest units (within about 100 feet) that have banks and/or sideslopes that are sensitive and therefore susceptible to damage.

2. The number, length and type of roads built, and the number of stream and riparian area road crossings required.

3. The cumulative proportion of area harvested in a watershed, with consideration given to its overall "sensitivity" based on factors including soil erodibility, stream stability, and drainage density.

4. Mitigation measures applied, including Best Management Practices (BMP's), Forest Plan guidelines, and site specific prescriptions.

Length of Affected Stream Channels

Risk of water quality degradation increases with the amount of near-stream harvest, and risk is greater where both sides of a channel are affected. Buffer strips, when put in place to protect sensitive banks and riparian areas, reduce this risk considerably; still, windthrow can cause increased sedimentation. Table 4-1 summarizes stream lengths that might be affected by harvesting units near streams in a given alternative. Data is expressed in terms of the management concerns mentioned in Chapter 3--sideslope stability (V-notches and areas where streambank composition minimizes bank stability concerns) and streambank stability (alluvial channels and similar areas where most (not all) buffer strips may be implemented). Data is also differentiated by whether harvest units would occur on one or both sides of a channel. In terms of overall affected stream length, streams would be subjected to the greatest risk by alternative 5, where 12.8 miles of stream would be near or pass through a harvest unit. The rest of the streams follow, in decreasing order: 5A (12.3 miles), 2 (8.4 miles), 4 (6.6 miles) and 3 (5.1 miles).

Table 4-1. Length of Streams in or near Proposed Harvest Units (within about 100 feet). Percentages below the subtotals and totals describe their part of the total lengths given in Chapter 3 for the two stream management concerns.

Management Concern	Length of Streams In or Near Units (Miles)					
	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 5A
STREAM BANK STABILITY						
With harvest units on:						
One side of stream	0	1.3	1.3	0.5	2.4	2.1
Both sides of stream	0	0.9	0.6	1.1	1.7	1.7
Subtotals:	0 (0%)	2.2 (3%)	1.9 (2.0%)	1.6 (2.0%)	4.1 (4.0%)	3.8 (4.0%)
SIDESLOPE[1] STABILITY (including V-notches)						
With harvest units on:						
One side of stream	0	3.3	1.8	2.9	5.0	5.0
Both sides of stream	0	2.9	1.4	2.1	3.7	3.5
Subtotals:	0 (0%)	6.2 (5.0%)	3.2 (2.0%)	5.0 (3.0%)	8.7 (6.0%)	8.5 (6.0%)
OVERALL (stream banks plus side slopes)						
With harvest units on:						
One side of stream	0	4.6	3.1	3.4	7.4	7.1
Both sides of stream	0	3.8	2.0	3.2	5.4	5.2
Totals:	0 (0%)	8.4 (4.0%)	5.1 (2.0%)	6.6 (3.0%)	12.8 (5.0%)	12.3 (5.0%)

[1] Channel sideslope, used here, is the length of ground from the bankfull channel to the first major slope break above bankfull.

Roads and Stream Crossings

The Transportation and Landform and Soils sections of this chapter include information regarding the type and length of roads to be constructed. Other factors being equal, the greater the total road length, the higher the risk of water quality degradation. Data from these sections indicate that Alternative 5 would require the most new construction of specified and spur roads (34.5 miles), followed in decreasing order by Alternative 5A (23.6 miles), Alternative 4 (21.7 miles), Alternative 2 (16.4 miles) and Alternative 3 (2.5 miles). The number of road crossings over all inventoried streams for the action alternatives (in decreasing order) are Alt. 5 (44); Alts. 2, 4, and 5A (34); and Alt. 3 (3).

Cumulative Effects

Cumulative Length of Affected Stream Channels

The cumulative effect of harvest units on streams includes the additive effect of stream lengths near proposed (Table 4-1) as well as existing harvest units. Cumulative harvest impacts occur primarily on the east side of Portage Bay since there is no previous harvest on Bohemia Mountain. Therefore, on the mountain itself, cumulative impacts are simply equivalent to the proposed harvest impacts. In terms of overall affected stream length in the study area, streams would be at greatest risk under the cumulative effects of Alternative 5, where 14.5 miles of channel would be near or pass through units (Table 4-2). Following, in decreasing order, are Alternatives 5A (13.9 miles), 2 (10.3 miles), 4 (8.3 miles), and Alternative 3 (7.0 miles). Selection of Alternative 1, the "no action" alternative, would have the cumulative result of 1.8 miles of affected channel due to units already harvested.

Table 4-2. Cumulative Length of Streams In or near Proposed and Existing Harvest Units (within about 100 feet). Percentages below the subtotals and totals describe their part of the total lengths given in Chapter 3 for the two stream management concerns.

Management Concern	Length of Streams In or Near Units (Miles)					
	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 5A
STREAM BANK STABILITY						
With harvest units on: One side of stream	0.7	1.9	1.9	1.2	2.7	2.5
Both sides of stream	0.1	1.2	0.9	1.2	2.2	2.2
Subtotals:	0.8 (1.0%)	3.1 (3.0%)	2.8 (3.0%)	2.4 (2.0%)	4.9 (5.0%)	4.7 (4.0%)
SIDESLOPE STABILITY (including V-notches)						
With harvest units on: One side of stream	0.5	3.6	2.1	3.3	5.2	5.1
Both sides of stream	0.5	3.6	2.1	2.6	4.4	4.1
Subtotals:	1.0 (1.0%)	7.2 (5.0%)	4.2 (3.0%)	5.9 (4.0%)	9.6 (6.0%)	9.2 (6.0%)
OVERALL (stream banks plus side slopes)						
With harvest units on: One side of stream	1.2	5.5	4.0	4.5	7.9	7.6
Both sides of stream	0.6	4.8	3.0	3.8	6.6	6.3
Totals:	1.8 (1.0%)	10.3 (4.0%)	7.0 (3.0%)	8.3 (3.0%)	14.5 (6.0%)	13.9 (5.0%)

Cumulative Effects of Roads and Stream Crossings

At the end of this project, cumulative lengths of roads within watersheds would include proposed new specified and spur road construction as well as previously constructed specified roads. The greatest cumulative length of these roads would occur in Alternative 5 (62.6 miles), followed in decreasing order by Alternative 5A (51.7 miles), Alternative 4 (49.8 miles), Alternative 2 (44.4 miles) and Alternative 3 (30.6 miles). The "no action" alternative would maintain the existing specified road length of 28.1 miles. The number of past and proposed road crossings over all inventoried streams for the action alternatives follow (in decreasing order): Alt. 5 (68); Alts. 2, 4, and 5A (58); Alt. 3 (27); and Alt. 1 (24).

Cumulative Proportion of Area Harvested by Watershed Sensitivity

Sensitivities to watershed areas of southeast Alaska are gauged by a model developed by McCorison, et al. (1988):These sensitivities were used in conjunction with beneficial use indices to estimate watershed harvest thresholds of concern. Harvest levels that are near or over the threshold produce increased risk of water quality degradation. Factors considered in this model include drainage densities, average channel stabilities of various channel types, erodibility of the various soils encountered, and an index of beneficial use values.

The model first assigns each watershed to one of four sensitivity classes. Then, the model considers the beneficial uses of the various streams and the sensitivity of their respective watersheds before assigning each watershed a recommended maximum harvest area. This percentage of the total watershed area is referred to as a watershed's threshold of concern.

When this test was run on the watersheds in the Bohemia Mountain analysis area, the results indicated that most of the analysis area sites would contain cumulative harvest levels well below their threshold of concern. Examples are found in Table 4-3.

Table 4-3. Examples of Watershed Thresholds of Concern and Corresponding Harvest Percentages.
Watersheds are correlated to stream numbers shown on Map 3-6

		Cumulative Percent of Watershed Harvested					
Watershed With Harvest Units	Harvest Threshold of Concern (%)	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 5A
Bohemia - east side (7)	50	0	3	0	14	14	14
Portage Creek above mouth (9)	48	6	6	6	6	6	6
Big Creek (2)	50	0	0	0	0	0	0
Duncan Salt Chuck above mouth (10)	25	0	1	0	2	2	2

Mitigation Measures

Aquatic habitat management unit (AHMU) guidelines will be followed and Regional Best Management Practices (BMP's) implemented. Site specific application of the BMP's will be done on the unit cards. These measures should minimize degradation of soil and water quality. Such measures include site specific use of vegetated streamside buffer strips, partial suspension of logs when yarding across streams, "splitlined" harvest settings, and minimizing of woody debris "loading" in stream channels.

Soils

The risk of impact on soils from timber harvest is often rated in terms of soil hazard classifications. Soil hazard classes reflect the probability of soil movement resulting from logging or road building activities. The probability is related to a number of factors such as soil strength, soil wetness, and slope. The soils in the low hazard class are found on 0 to 35 percent slopes, are mostly stable in the natural setting, and have little probability of soil movement if disturbed. Moderate hazard soils are generally found on 35 to 75 percent slopes, are relatively stable in the natural setting, and have increased probability of movement if they are disturbed. The soils in the high hazard class are usually found on slopes greater than 75 percent, often creep or slide in a natural setting, and are extremely prone to soil movement if disturbed. Consequences from timber harvest are related to the number of acres harvested and the soil hazard class on which the trees are growing.

Timber Harvest and Soil Hazard Class

Table 4-4 shows the area of land in each hazard class that would be harvested for each alternative. This data is based on the Soil Resource Inventory for Kupreanof Island. Data in Table 4-4 has changed somewhat since the DEIS as a result of on-site field investigations. Changes have been made in the design and configuration of harvest units and roads to avoid or minimize potential impacts to soils or associated resources.

Table 4-4. Area Harvested In Each Soil Hazard Class

SOIL HAZARD	ALTERNATIVE					
CLASS	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Low	0	310	248	210	577	458
Moderate	0	519	118	662	840	812
High	0	0	0	0	0	0
Total Acres	0	829	366	872	1,417	1,270

Road Building

Road building impacts are related to the length of road constructed and the soil hazard class in which each segment is built. Table 4-5 shows the miles of road in each hazard class for each alternative.

The upper Duncan Creek watershed, on the south side of Bohemia Mountain, has been identified as an especially hazardous area due primarily to the presence of V-notches deeply incised into "blue clay" deposits. An area of particular concern is the steep gorge of upper Duncan Salt Chuck Creek. In general, the generic term "blue clay" is used to describe any relatively dense, relatively fine textured soil material with a grayish or bluish-gray color. The geologic origin and physical properties of the material are sufficiently variable to merit distinguishing at least three different types of materials:

1. ***Compact glacial till***- Glacial till that is gravelly loam to silt loam in texture, massive and very dense, hard when dry, and grayish-brown to bluish-gray in color. This material is very common and widespread throughout the Stikine Area. This soil material is stable in place on slopes up to 65 percent.

2. ***Glacial marine till***- This fine-textured glacial till material has a higher content of clay-sized particles and is typically bluer in color than the common compact till. Theory suggests that is being deposited by the glacier in an underwater environment. Localized areas of water stratified material (some with fossil shell remains), are typical in this material. It is most common at elevations near sea level (0 to 500 feet). Small slumps and slides are very slow to revegetate and are readily apparent on sloping areas, especially those adjacent to or subject to undercutting by stream channels. (This is the hardpan material that underlies most of the muskeg in the city of Petersburg).

3. ***Stratified (laminated) silt, silty clay and very fine sand***- This is the most hazardous blue clay material. It is highly unstable in cut or fill slopes and readily liquifies when disturbed. It is subject to rotational failures in streambanks and cutslopes where the toeslope has been undermined. This material is extensive in the Kake, Sloduc Creek area, but is scattered in small, isolated, low elevation locations throughout the Stikine Area. It is often associated with glacial marine till.

If cut and fill slopes are not required, overlay roads can be constructed on blue clay soils without significant impacts.

Road construction on steep slopes, however, can present very serious instability and soil erosion problems, and in this case, could cause serious sedimentation to Duncan Salt Chuck Creek.

Compact till normally requires full bench and end haul, as well as a cutslope angle of 1:1 or less. Road construction should not be attempted on steep slopes of glacial marine till or stratified materials without very unusual and expensive measures such as construction of retaining walls or slope buttressing techniques.

Results of field investigation indicate that much of the operable CFL on the north side of Duncan Salt Chuck Creek can be accessed by road while avoiding areas of "blue clay" soils on steep slopes. Locating the road high on the slope, away from Duncan Salt Chuck Creek, while it does involve numerous stream crossings, avoids crossing streams that are deeply incised into highly erosive soils (see road and unit descriptions, Appendices G and F).

Table 4-5. Miles of Specified Road Proposed In each Soil Hazard Class.

Soil Hazard	Alternative					
Description	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Low	0	7.2	1.4	11.1	21.2	11.6
Moderate	0	6.6	0	7.6	7.7	9.8
High	0	0	0	0	0	0
Total	0	13.8	1.4	18.7	28.9	19.3

Cumulative Effects

The range of time required for potentially unstable areas to restabilize varies greatly. Some unstable areas can stabilize in as little as three to five years, while others require more time. While some become chronic sources of sediment, any slides or slumps in the analysis area are expected to recover relatively quickly.

Wetlands and Floodplains

Since a high percentage of the Tongass (and about 70 percent of the Bohemia Mountain analysis area) is classified as wetlands, these areas are not considered a scarce resource. Resource values associated with these wetlands vary greatly, depending on the type of wetland, proximity to water bodies, landscape position, and other factors. Alternatives were designed to minimize potential impacts to identified high-value areas, rather than to avoid development on all areas technically classified as wetland.

The potential impact to wetlands is indicated by the amount of forested wetlands proposed for harvest (Table 4-6), and the amount of specified road proposed to be built on areas classified as wetland (Table 4-7).

Timber Harvest and Wetlands

Alternatives 5 and 5A would harvest the greatest amount of forested wetlands, followed by Alternative 4 and Alternative 2. Alternative 3 would harvest the least.

Table 4-6. Timber Harvest on Forested Wetlands.

Harvest on Wetlands	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Acres of Forested Wetlands	0	123	1	284	290	285
Percent of Forested Wetlands	0	0.04%	0%	0.9%	1.0%	0.9%
Percent of Total Wetlands	0	0.02%	0%	0.6%	0.6%	0.06%

Roads and Wetlands

The wetland vegetation and soil drainage characteristics of a wetland will not be measurably altered by road construction except for the width of the roadfill itself. This is normally about 24 feet wide and amounts to approximately 2.9 acres per mile.

Alternative 3 would result in no road construction on wetlands. Alternative 5 would construct the greatest amount of roads on wetlands followed by Alternative 5A, 4, and 2.

Table 4-7. Specified Road on Wetlands.

Roads on Wetlands	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Miles of Road	0	7.5	0	11.7	19.0	11.7
Acres Covered	0	21.8	0	33.9	55.1	33.9
Percent of Specified Roads on Wetlands	0	55%	0	63%	66%	61%

Floodplains

Executive Order #11988 dealing with floodplains was largely intended to prevent the construction and occupancy of floodplains so that flood events would not destroy property and cause loss of life. None of the proposed timber harvest or road building activity in any of the alternatives would affect any floodplains.

Cumulative Effects

To date, 26 acres of forested wetlands have been harvested, and zero miles of road have been built on wetlands in the analysis area. The additive effect of each alternative is presented in Table 4-8.

Table 4-8. Cumulative Acres of Wetlands Affected

Roads on Wetlands	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Acres Harvested	25.7	148.7	26.7	309.7	315.7	310.7
Percent of Wetlands	0.05%	0.3%	0.06%	0.6%	0.7%	0.7%

Fish

Stickleback and Coho

It has been extremely difficult to determine specific cause and effect relationships between some forest management practices and variations in salmonid populations. Wild, unmanipulated populations have been found to vary naturally as much as fifty percent due to climatic conditions, escapement, predation, and other variables. Some land management activities can result in masking some effects while compounding others, making it difficult to predict simple causes and effects in order to estimate quantitative changes in fish populations. However, various studies have determined some general and basic needs of the salmonid. These needs can be translated into management activities in order to eliminate or reduce adverse impacts on fish populations.

Buffers

The Tongass Timber Reform Act of 1990 prohibits the commercial harvest of timber within a buffer zone no less than one hundred feet in width on each side of all Class I streams and those Class II streams which flow directly into a Class I stream. The maintenance of a buffer zone is a management practice/prescription used to reduce the risk of damage to fish habitat. However, buffers are not without risk themselves, as they are subject to windthrow. Streamside trees that blow over have greater potential to cause even more severe damage to fish habitat than does cutting the trees, depending on channel type and fish species affected. A buffer needs to be relatively windfirm to be effective in moderating stream temperatures and providing a future source of large woody debris. This is often accomplished by locating the length of the buffer parallel to the prevailing direction of storms and/or extending the buffer to a windfirm topographic boundary. The trees left standing along the streams provide the following:

- stability of the stream banks,
- a continuing source of large woody debris available for stream habitat maintenance,
- shade for surface water to protect it from extreme temperature increases that may kill fish,
- a source of needles, leaves, litter, and insects as a nutrient base in the food chain.

Risk

Consequences are measured by the degree to which there is a potential for damage to, or loss of, the resource. Guidelines for managing stream resources for fisheries protection are provided in the *Region 10 Aquatic Habitat Management Handbook (FSH 2609.24)* which provides state-of-the-art guidance for developing riparian management presciptions. These prescriptions minimize water quality degradation and, subsequently, the risk to fisheries which would be presented by implementation of any of the action alternatives. Class I and II streams are covered in the Handbook, as are Class III streams that do not contain fish populations but are important because of their effect on downstream water quality. In addition, recognized prudent management activities or best management practices (BMP's) are employed. (Refer to *Region 10 Soil and Water Conservation Handbook, FSH 2509.22*.) This will eliminate some direct and indirect effects and will reduce the risk of other indirect effects to the greatest extent practicable within the context of management goals as defined by law, regulation, and administrative decision.

While any activity poses some risk to resources, by following these guidelines, no measurable effect is anticipated and there should be no habitat-related reduction in the fish population. Streams crossed by roads will have proper culvert and bridge installations to protect fish habitat and passage. However, there is a possibility that the trees remaining in each Aquatic Habitat Management Unit (AHMU) will blow down. This possibility is considered when determining the timber harvest's potential impact on fish. Probability, in turn, is related to the number of miles of stream requiring AHMU prescriptions and whether or not both sides of the stream would receive impact. Table 4-9 displays the miles of stream relative to each alternative which will require Class I, II, or III AHMU prescriptions.

Slide from Blowdown

Table 4-9. Miles of Stream Requiring Class 1, Class 2, and Class 3 AHMU Prescriptions.

AHMU CLASS	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Class 1: 1 side	0	0	0	0.50	0.75	0.75
Class 1: 2 sides	0	0	0	0.50	0.75	0.50
Class 2: 1 side	0	0.35	0.35	0.38	0.73	0.73
Class 2: 2 sides	0	0.15	0.05	0.60	0.65	0.65
Class 3: 1 side	0	3.55	2.30	1.70	4.10	4.10
Class 3: 2 sides	0	2.63	1.38	1.55	2.93	2.93
Total: 1 side	0	3.90	2.65	2.58	5.58	5.58
Total: 2 sides	0	2.78	1.43	2.65	4.33	4.08
Total: 1 and 2 sides	0	6.68	4.08	5.23	9.91	9.66

Crude measures of *relative*, not *absolute*, risk to fisheries include total length of roads, total length of buffered and unbuffered stream channel, total number of stream crossings, and total acres of harvest within fish stream watersheds. Combined, these relative risk factors provide a means of comparing development alternatives with regard to potential impact on fisheries. These factors are displayed in Table 2-1 in Chapter 2.

Enhancement Opportunities

There is an opportunity to modify a fish barrier on Duncan Salt Chuck Creek and to install egg boxes at a site on stream 110-16-006. Both projects will require feasibility studies and further planning.

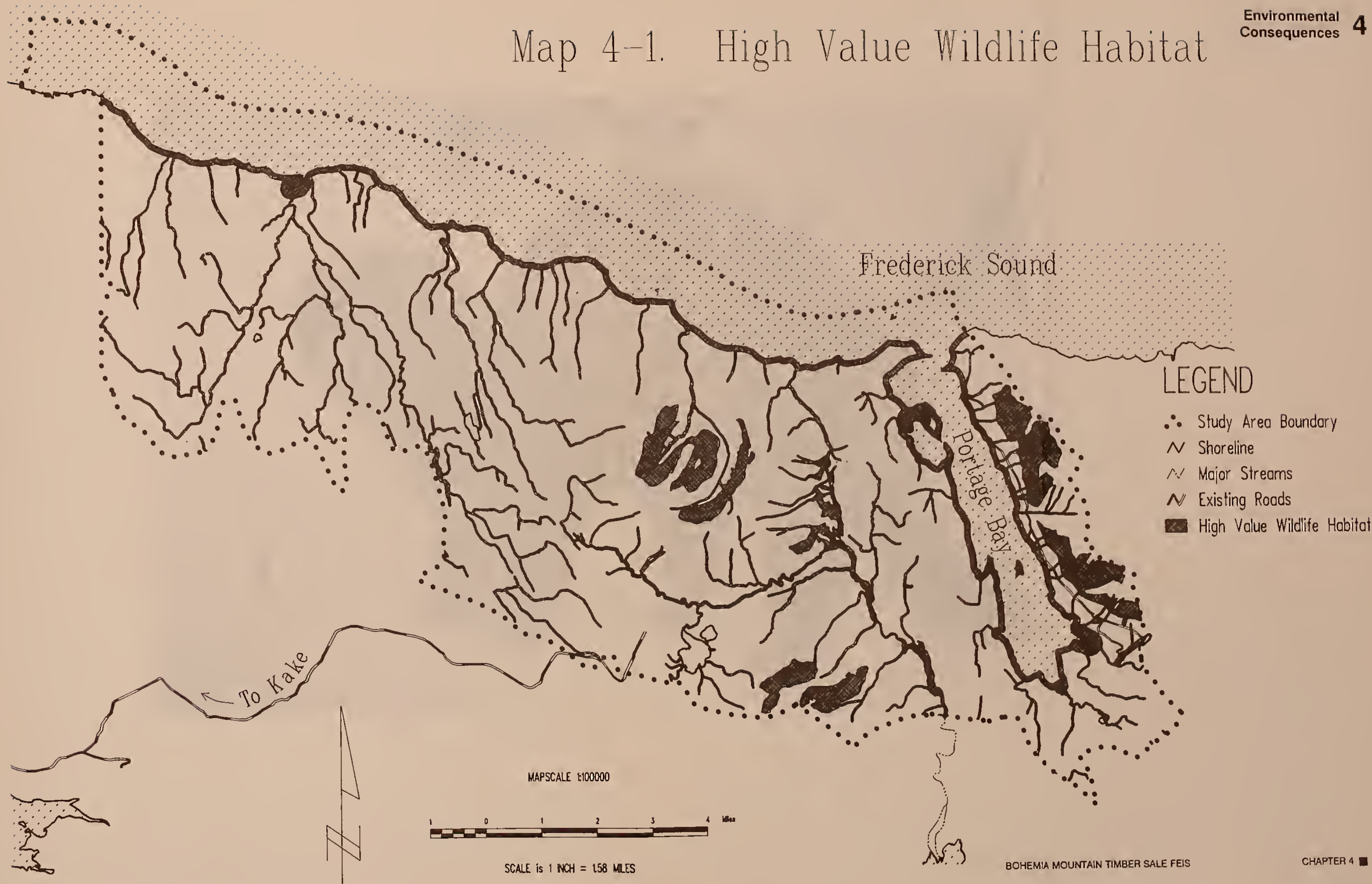
Cumulative Effects

An increase in sport fishing pressure can be expected while the camp is in Portage Bay and/or Hamilton Bay near Kake. Increased access provided by establishing a road system would probably result in a slight increase in levels of sport fishing within the analysis area during and after completion of the sale. Any proposed stream improvements would increase fish production over the long term. Big Creek (Map 3-6, stream #2) is one possible candidate for stream improvement. Escapement Counts on Big Creek for pink salmon range from 200 to 8,500. Additional road access to the area would reduce any stream enhancement costs.

Wildlife Habitat Maintained

A total of 1,131 acres would be maintained for wildlife habitat in this analysis area under current Forest Plan direction. In addition to the standards and guidelines of Forest Plan and Regional Guide, the National Forest Management Act directs that viable populations of existing native and desired non-native vertebrate species will be maintained and well-distributed throughout the planning area. Alternatives 1 and 5A comply with this direction, based on numbers and distributions of the selected management indicator species available from an interagency task force. The task force was charged with determining the minimum populations needed to meet the requirements of the Act. (Refer to the planning record for minimum viable population requirement analysis by ADF&G Wildlife Analysis Areas.)

Map 4-1. High Value Wildlife Habitat



Because the Forest Plan is currently being revised, standards and guidelines proposed for managing wildlife habitat are also being revised. One of the more significant proposed changes is the recognition of the value of retaining large, appropriately distributed blocks of older-aged forest. The Tongass Land Management Plan Revision proposes several indicator species that are sensitive to forest fragmentation and may require minimum patch sizes to provide optimum habitat.

Threatened and Endangered Species

There are no listed animals or plants known to frequent or occur in the analysis area. Humpback whales and sea lions inhabit Frederick Sound adjacent it. However, activities associated with this timber sale are not anticipated to have any effect on these marine mammals. Therefore, this sale should have no adverse impacts on any threatened or endangered species.

Wildlife

Three measures of consequences were analyzed and displayed by alternative to address the environmental effects of the five action alternatives which propose various levels and designs of timber harvest.

Consequence A: Proposed acres harvested and miles of road constructed by type of wildlife habitat. The wildlife models used for this analysis assume the highest quality habitat, in order of priority for all species combined, to be estuary, beach fringe, riparian and general forest.

Consequence B: The effects of implementing the various alternatives on wildlife habitat capability expressed by numbers of management indicator species that the analysis area is capable of supporting following alternative implementation.

Consequence C: Number, size and distribution of older aged forest habitat blocks that remain after implementation as an expression of older aged species viability, ecosystem productivity and plant and animal biodiversity. Old-growth-dependent species are those species which require older-aged forest for survival and reproduction.

Display of Consequences

Consequence A - Effect of road construction on habitat: The Habitat Capability Models together with field surveys and a review of historical data and reports were used to determine the most valuable and productive wildlife habitat for the widest diversity of wildlife species. The Tongass Land Management Plan requires the maintenance of about 1,130 acres for wildlife purposes. Areas selected to be maintained for this purpose through the planning period include a 1,000-foot buffer around all estuaries, a 500-foot buffer strip along all beach fringe, and a minimum wind firm buffer of not less than 100 feet in width on each side of all Class I streams and all Class II streams flowing directly into Class I streams. (See Map 4-1)

Table 4-10 displays the number of acres proposed for harvest by wildlife habitat type for each alternative. No harvesting is proposed in the two most valuable habitats, estuary and beach fringe. A maximum removal of 41 acres out of roughly 9,000 acres identified as high value wildlife habitat is proposed in Alternatives 5 and 5A. All proposed alternatives would leave nearly seven to eight times the minimum requirement of 1,130 maintained acres of high value habitat.

Table 4-10. Summary of Acres Proposed for Harvest by Alternative

	Alt. 1	Alt.2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Estuary	0	0	0	0	0	0
Beach Fringe	0	0	0	0	0	0
Riparian	0	9	9	32	41	41
Forest	0	830	367	871	1,416	1,270

Displayed in Table 4-11 are the miles of road proposed by alternative in the four defined habitats. While the analysis of consequences is more subjective and not as easily addressed, the potential effects of disturbance and habitat alteration need to be displayed. Of particular concern were the effects of roading adjacent to the valuable waterfowl estuary at the south end of Portage Bay (Alt. 5). These effects were avoided by locating the road over 1000 feet from the estuary.

Table 4-11. Miles of Road Proposed for Construction by Alternative

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Estuary (miles)	0.0	0.0	0.0	0.0	0.0	0.0
Beach Fringe (miles)	0.0	0.0	0.0	0.0	0.0	0.0
Riparian (# crossings)	0	9	0	2	30	21
Forest (miles)	0.0	13.8	1.4	18.6	28.9	19.2

Consequence B - Effect of timber harvest on habitat: The consequences of timber harvest on selected wildlife indicator species were analyzed with the use of computer-generated habitat suitability models developed for the Tongass Forest Plan Revision. The model outputs were field verified for accuracy during the summer of 1990.

Consequences addressing the effects are displayed for four periods in time: first, prior to 1954, to indicate habitat capability before any significant timber harvest; second, 1990, to display the current condition; third, 1991-2015, to display anticipated effects of implementation for all alternatives for the next 25 years; and fourth, 2091, or 100 years following implementation, to display cumulative effects through the 100-year timber management rotation. The 100-year outlook includes harvest of all CFL under current Forest Plan, which is being amended. This is in recognition that lands within the analysis area, with the exception of VCU 441.1, are allocated to timber production (LUD IV) and will be harvested within prescribed guidelines by the end of the planned rotation. This 100 year reduction would occur under the current Forest Plan, if fully implemented, regardless of this proposal.

Figures 4-1 through 4-5 display the consequences of alternative implementation on habitat capability for Sitka blacktailed deer, marten, black bear, river otter and bald eagle.

Cumulative Effects on Potential Deer Population by Alternative

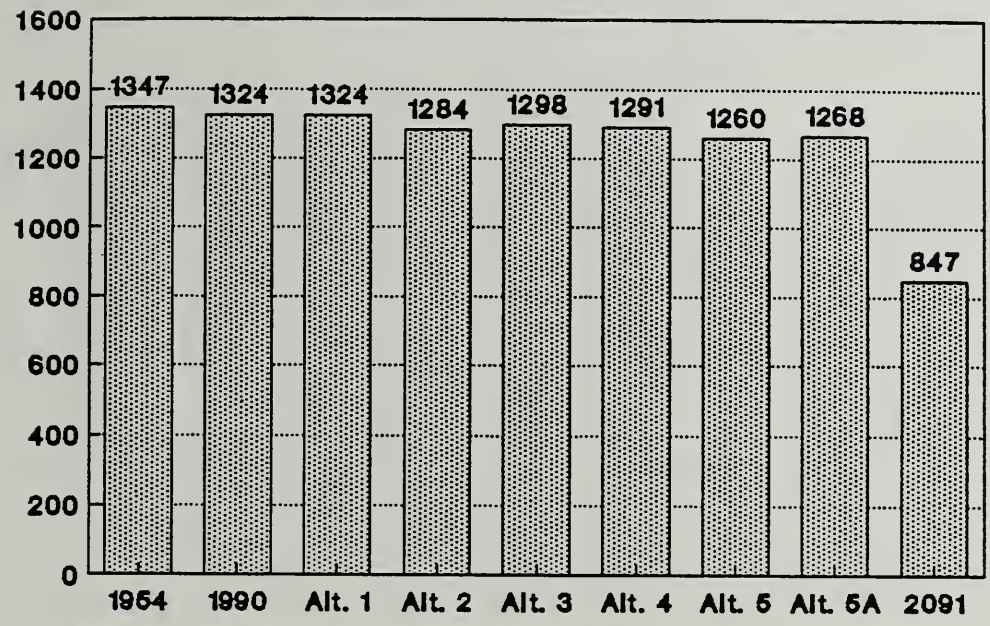


Figure 4-1. Effects on Potential Deer Population, by Alternative

Cumulative Effects on Potential Marten Population by Alternative

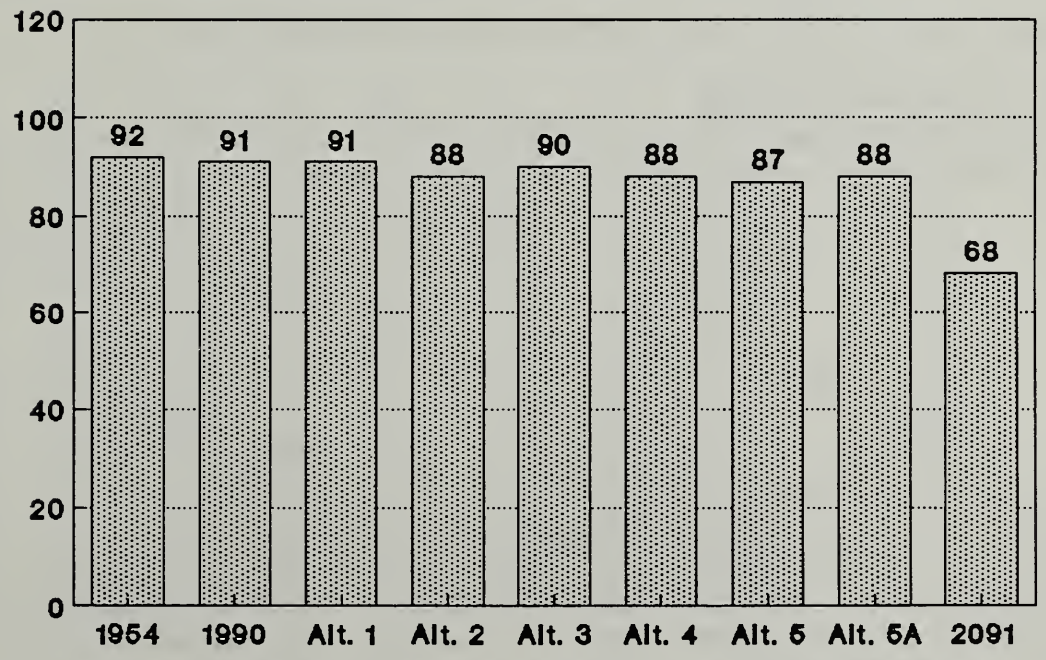


Figure 4-2. Effects on Potential Marten Population, by Alternative

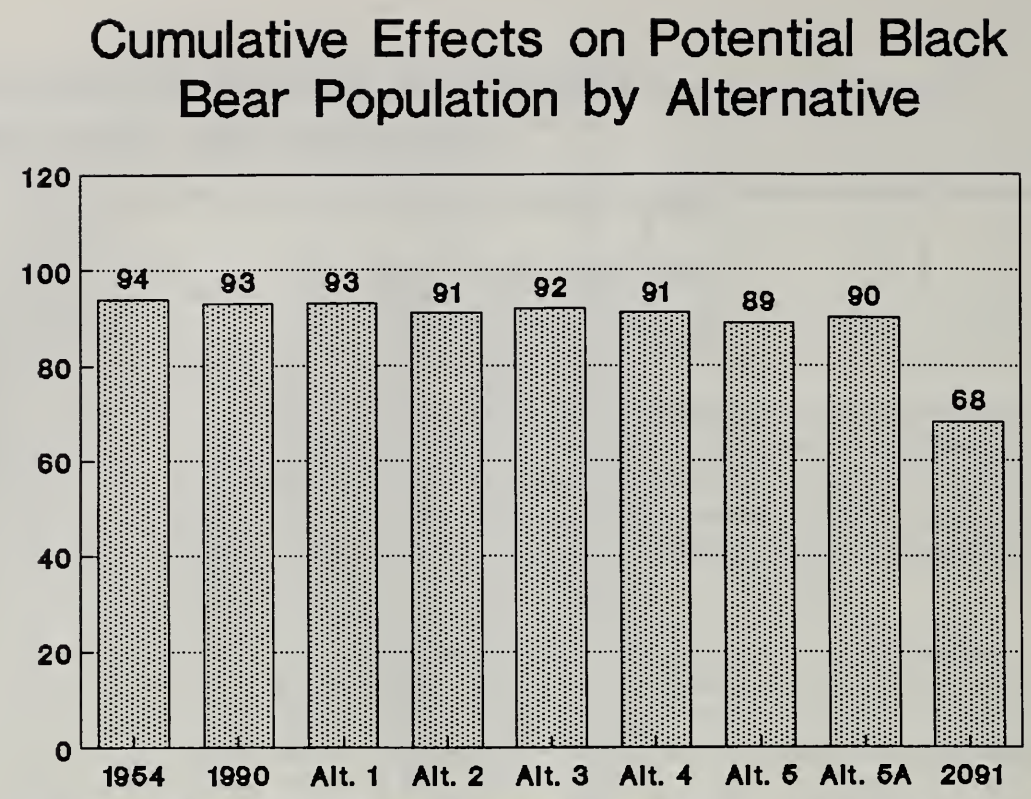


Figure 4-3. Effects on Potential Black Bear Population, by Alternative.

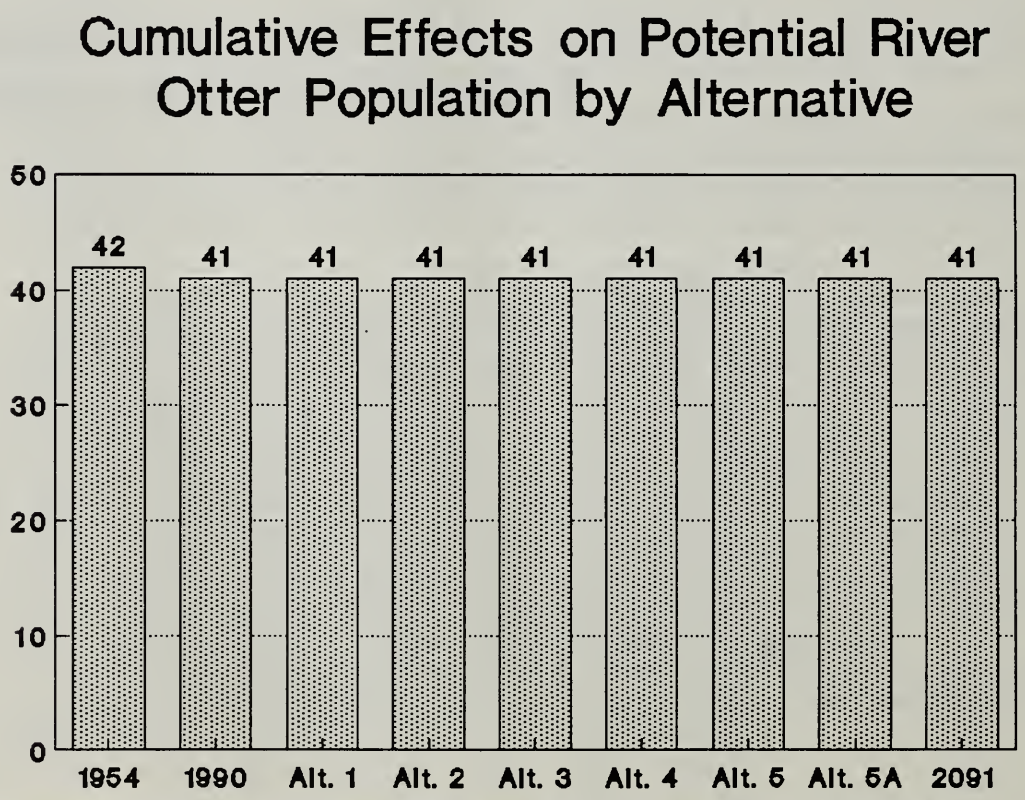


Figure 4-4. Effects on Potential River Otter Population, by Alternative

Cumulative Effects on Potential Bald Eagle Numbers by Alternative

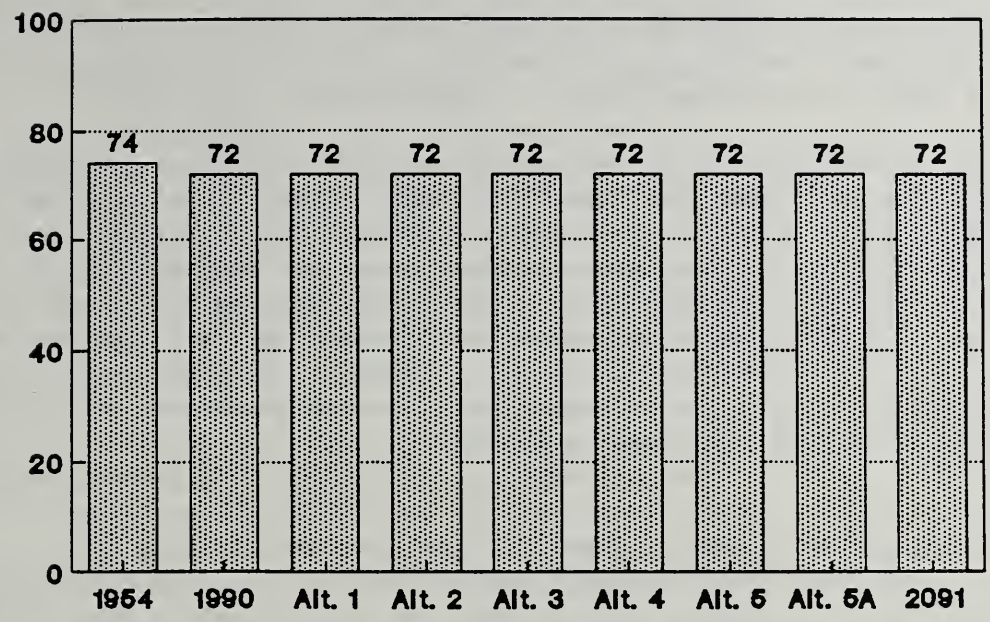


Figure 4-5. Effects on Potential Bald Eagle Numbers, by Alternative

Consequence C - Older aged Patch Size. Table 4-12 displays estimates of minimum older aged patch size necessary to provide optimum habitat effectiveness for proposed management indicator species thought to be sensitive to habitat fragmentation. (*Analysis of the Management Situation, Tongass National Forest Land and Resource Management Plan Revision R10-MB-89*)

Table 4-12. Estimates of Older Aged Patch Size for Selected Species

Management Indicator Species	Minimum Patch Size for Optimum Habitat (Acres)
Sitka black-tailed deer	1,000
Brown creeper	15
Hairy woodpecker	500
Red breasted sapsucker	250
Pine Marten	180
Red Squirrel	30
Goshawk	2,500
Marbled Murrelet	600

As part of the effects analysis, changes in management direction such as older aged forest block size and distribution were considered, even though proposed management activities will continue under the direction of the current Forest Plan until the Revision is completed. This proposed timber harvest is consistent with current Forest Plan direction and is scheduled to be offered for sale prior to the completion of the revised plan.

On the Tongass National Forest, several management indicator species proposed for the revision of the Forest Land Management Plan appear to be sensitive to forest fragmentation caused by timber harvest and may require minimum patch sizes for optimum habitat (refer to Table 4-10). In addition, several other species, including the northern goshawk and marbled murrelet, are believed to be dependent on large blocks of undisturbed older aged forest.

Individual drainages and large contiguous forest blocks within the Bohemia Mountain analysis area represent unique functioning ecosystems. Existing and proposed harvest units, large muskegs, subalpine habitat and shorelines were used as boundaries to define existing and remaining forest blocks following alternative implementation. A minimum size of 800 acres comprised of older age class timber (volume class 4 and above) was selected to represent forest blocks meeting the habitat requirements of dependent species. For comparison purposes, the greater the number and size of well-distributed forest blocks, the greater the opportunity for species viability and ecosystem biodiversity for most southeast Alaska plant and animal communities.

Average remaining forest block size varies considerably by alternative from the existing condition, as shown in Table 4-13 and in Map 3-7. The long term cumulative effects over the 100-year rotation would vary far less, assuming harvest projections in the current Forest Plan. However, in the near term, maintenance of large older age forest blocks retains options and provides greater flexibility for future planning efforts.

Table 4-13. Older Age Class Forest Blocks Remaining by Alternative

Alt.	# of Blocks	Location	Acreage	Avg. Block Size
1	4	N. Bohemia Mtn. Duncan River Upper Portage S. Bohemia Mtn.	6,713 862 1,060 2,196	2,708
2	3	N. Bohemia Mtn. Duncan River Upper Portage	6,713 862 943	2,839
3	4	N. Bohemia Mtn. Duncan River Upper Portage S. Bohemia Mtn.	6,713 862 943 2,196	2,679
4	3	N. Bohemia Mtn. Duncan River Upper Portage	2,872 862 1,060	1,598
5,5A	3	N. Bohemia Mtn. Duncan River Upper Portage	2,872 862 943	1,559

Subsistence

This section evaluates the possibility of a significant restriction of subsistence use in the Bohemia Mountain analysis area.

ANILCA Section 810 Subsistence Evaluation

The Alaska National Interest Lands Conservation Act (ANILCA), Section 810, mandates that Federal agencies having jurisdiction over lands in Alaska evaluate the potential effects of proposed activities on subsistence uses and needs. Section 810 of ANILCA specifies:

In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands under any provision of law authorizing such actions, the head of the agency having primary disposition over such lands or his designee shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be affected until the head of such federal agency:

1. *gives notice to the appropriate state agency and appropriate local committees and regional councils established pursuant to ANILCA Section 805;*

2. *gives notice of, and holds, a hearing in the vicinity of the area involved; and*

3. *determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands; (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or disposition; and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such action.*

Sitka Black-Tailed Deer

This portion of the evaluation examines the proposed action alternatives for the analysis area and whether there may be significant restriction of the subsistence resources used by the area communities. Categories evaluated here are deer, furbearers, waterfowl, and black bear. The effects of proposed alternatives are evaluated by (1) changes in abundance or distribution of subsistence resources, (2) changes in access to subsistence resources, and (3) changes in competition from non-rural users of subsistence resources. This process determines whether subsistence uses within the analysis area or portions thereof would be significantly restricted by any of the proposed alternatives.

In order to determine this, the evaluation does the following:

Black Bear

1. Considers the availability of subsistence resources in surrounding areas;

2. Considers the cumulative impacts of past, present, and reasonably foreseeable future activities on subsistence resources and users;

3. Looks at potential socio-cultural and socio-economic implications affecting subsistence users; and

4. Focuses on the important, mapped subsistence use areas within the analysis area.

This evaluation relies on the use of wildlife habitat capability models, ADF&G hunter survey data, and the Tongass Resource Use Cooperative Survey (TRUCS) questionnaire and mapped data.

ANILCA Section 810 hearings were held in Kake (June 26, 1991) and Petersburg (June 24, 1991). During the hearings, no significant impact to subsistence was expressed by people giving testimony. Most of the comments expressed at the hearings dealt with issues other than subsistence.

Three rural communities (Kake, Petersburg, and Wrangell) have documented use of the various subsistence resources within the analysis area. TRUCS (1987-8) revealed that for these three communities, the average pounds harvested throughout southeast Alaska, per household, was 160 pounds for Kake, 165 pounds for Wrangell, and 203 pounds for Petersburg (see Chapter 3).

Deer

The Alaska Board of Game closed much of northern portions of Game Management Unit (GMU) 3, in 1975, to all deer harvest. In recent years there has been no documented deer hunting throughout northern GMU 3. This would suggest that those households/communities utilizing the northern portions of GMU 3 have shifted their deer harvesting to other nearby islands, such as portions of Admiralty, Baranof, Chichagof, and Prince of Wales Islands.

As many as 37 proposed timber harvest units are being considered in Alternative 5 and slightly fewer units in the other action alternatives. Several units are within former and potential important deer subsistence use areas. The projected effects to deer resulting from timber harvesting of these units are evaluated in the Wildlife section of this document. The effects are evaluated even though the deer population on Kupreanof Island is currently below a huntable level according to the Alaska Board of Game. The projected effects on habitat capability in the analysis area ranged from no effect to a maximum of 7 percent reduction.

Furbearers

The trapping of furbearers takes place within the analysis area, as indicated by harvest records from the Alaska Department of Fish and Game. A number of proposed harvest units are within important potential furbearer habitat/subsistence use areas. The numbers of users and their success within this analysis area calls into question trapping as a significant source of subsistence to the communities and households having documented use of VCU 424, 441.1, and 442. Past, present, and reasonably foreseeable projections, indicate a slight decline in the pine marten habitat capability.

Waterfowl

A variety of waterfowl are hunted from Portage Bay, segments of the sheltered southshore of Frederick Sound, and a number of unnamed small inland lakes (refer to the Wildlife section 3-22).

The wildlife section concluded that the proposed alternatives would have a minimal effect on the wetlands within the analysis area.

Black Bear

In Chapter 3 it was reported that Kupreanof Island is an important area for the sport and subsistence taking of black bear. The Portage Bay shoreline is an especially valued area. However, when viewing the various wildlife alternatives for this planning period, the effects would be none to minimal.

Access

Alternative 1 would maintain the unroaded character of the Bohemia Mountain analysis area. Access would remain by foot, boat, or floatplane. Alternative 5 would provide 28.9 miles of permanent, specified road that would improve access to subsistence resources. Alternative 5A would provide 19.2 miles of specified road, Alternative 4 would provide 18.6, Alternative 2 would provide 13.8, and Alternative 3 would provide 1.4 miles.

Changes in Competition From Non-Subsistence Users

During the life of the timber sale, it is likely that an average of 60 people will live and work out of a camp near Portage Bay or Kake for up to five years. Some residents of the camp may meet residency requirements and qualify as subsistence users, and all residents could purchase sport hunting and fishing licenses. There is likely to be an increase in use of subsistence resources by camp residents; however, the lack of subsistence use in the area at this time suggests there are few subsistence users with whom camp residents could compete. Consequently, no increase in competition is anticipated.

Abundance and Distribution

The harvest of timber in the area would reduce the amount of potential habitat available for a number of subsistence species. However, effects appear to be minimal.

Deer

Based on predictive modeling and other subsistence sources, it would appear that deer populations will not be greatly affected by any of the proposed action alternatives (see Figure 4-1).

Furbearers

Hunting and trapping of subsistence species within the analysis area appears minimal. Action alternatives project zero to minimal impacts to furbearers.

Waterfowl

The proposed action alternatives will have zero to minimal impacts on the abundance and general distribution of waterfowl.

Black Bear

Action alternatives are projected to have minimal impact on black bear habitat. Furthermore, roading and harvesting of timber are expected to have similar results on their abundance and distribution.

Salmon

Changes in the salmon population are not anticipated in any of the action alternatives. All proposed cutting units near existing or potential salmon spawning and rearing streams are protected by no-cut and transition buffers as defined in the AHMU Handbook. Thus the impact on salmon harvest for subsistence use would be negligible.

Other Finfish

The action alternatives are projected to have no impact on other finfish habitat. Therefore the subsistence use would not be affected.

Marine Mammals
The small population of harbor seals that uses Portage Bay and the surrounding waters may be temporarily displaced by water-based logging activities. This would only occur during the three to five years of sale activity. Since there is no documented harvest of marine mammals in the Portage area, the impact of this sale on subsistence use is expected to be low and temporary.

Cumulative Effects

Because the 10-year sale plan shows no future sales in the area, no cumulative effects beyond those shown for this project can be anticipated. Therefore, the changes in habitat capability will have minimal to no effect on abundance and distribution.

Recreation

In discussing the primary issue, the Portage Mountain Loop Trail and the Petersburg Creek-Duncan Salt Chuck Wilderness, the impacts are described in terms of changes to the setting, using the Recreation Opportunity Spectrum (ROS) system. The east segment refers to the segment of trail from Portage Bay to Petersburg Lake, outside of the Wilderness. The west segment refers to the trail from Portage Bay to Duncan Salt Chuck, outside the Wilderness. Each segment is about two miles long.

Trail & Wilderness

Of the five action alternatives, Alternative 5 is the only one which would directly affect the Wilderness and trail. In the Wilderness, about 160 acres would change from a designation of "semi-primitive nonmotorized" (SPNM)* to "roaded modified" (RM) due to the presence of a road segment within ½ mile and a harvest unit within ¼ mile of the Wilderness boundary. Harvest activities and vehicle traffic could be partially seen and heard from within the Wilderness. On the east segment of the trail the ½ mile north of the Wilderness boundary would change from SPNM to RM due to the visibility of nearby harvest units and roads. The road crossing on the east segment would change the trail corridor setting to RN from SPM and SPNM for one mile, a half a mile on either side of the road crossing. The breakdown of the trail then, would be approximately ½ mile = RM, 1 mile = RN, and ½ mile = SPM. During harvest activities, road construction, and haul periods, most of the east segment would be in a "roaded modified" setting.

The west segment of the trail would also have a road crossing, which would change to RN from SPM/SPNM for most of the trail corridor outside the Wilderness.

*The ROS classifications are further explained in the glossary.

General Setting Impacts

This section describes changes to the existing recreation opportunity settings, using the ROS system. The changes are summarized first, then the implications discussed.

Table 4-14. Expected Impacts on the ROS Settings Relative to the Action Alternatives

Alter-native	East and Southeast Portage Bay	Bohemia Mountain
1	No change	No change
2	Increase in "roaded modified" from "semi-primitive motorized" area above existing units.	Large reduction in primitive core, resulting in Roaded Modified on south side of Bohemia Mtn. The primitive core on the north side and to the south of Bohemia Mtn. changes to "semi-primitive nonmotorized".
3	Same as Alternative 2.	No change from existing setting.
4	No change from existing setting.	Largest reduction in primitive core, similar to alternative 2. "Roaded modified" increased on the north side of Bohemia Mountain from "semi-primitive" and "primitive" settings. The only "primitive" setting remaining in the analysis area would be the muskeg flats on the west side.
5	In addition to impacts in Alternative 5A, a "roaded natural" corridor would exist, from "semi-primitive" settings. This would split the "semi-primitive" settings north of the road from those south of the road.	
5A	Same as Alternative 2.	Same as Alternative 4.

ROS Changes

The changes in settings, including those within the Wilderness, are all consistent with Forest Plan direction. It is general policy that Wilderness areas do not have a buffer around them. No unique values would be foregone, except for the changes to the trails described below and minor changes in Wilderness settings.

Most of the recreation places would remain in their existing settings. Those that do change would not have a great impact on the activities associated with them, except as noted below by alternative.

Alternatives 2, 4, and 5A provide additional roaded access for the residents of Kake for activities such as gathering forest products, driving for pleasure, and hunting. These opportunities do not appear to be in short supply for Kake. The new opportunities created would involve a lengthy day trip from Kake, and thus recreation use is expected to be light. Potential opportunities at Bohemia Lake would be maintained in the existing setting under all alternatives.

Alternative 5 provides additional access from Kake to recreation opportunities such as hunting, fishing, boating in Portage Bay, and hiking. It would provide access to the Portage Mountain Trail and the Petersburg Creek-Duncan Salt Chuck Wilderness. As previously noted, this would be the only Wilderness in southeast Alaska accessible by road, a feature that could be used as a promotional tool for tourism. Either way, increased use of the Wilderness can be expected. The currently low number of social encounters in this portion of the Wilderness is likely to increase.

The trails would likely begin to show increased damage, as users break through the muskeg mantle of this unimproved trail. This would need to be monitored over time. If the damage were to become unacceptable, the trail would need to be hardened with planking, relocated, or have use restricted. This would depend on the objectives for this section of the Wilderness, and the amount of use, which is expected to be light, given the distance from Kake.

Alternative 5 might have the greatest impact on future opportunities for the City of Kupreanof to develop "cottage industries" associated with use of the trails and Wilderness. It would also affect existing users by decreasing the possibility for solitude and interrupting the contiguous semi-primitive settings, making them into areas with road crossings and evidence of harvest activities. The users would either be displaced, or adjust to the changes. This impact might be lessened with road closures, scheduling harvest activities adjacent to the trail in as few operating periods as possible, and/or constructing a short (2-3 miles) segment of trail to tie together the two segments of the Portage Mountain Trail in the vicinity of the Wilderness boundary. This would give users the option of avoiding the road crossing and maintaining a contiguous semi-primitive setting. Users could also reach Portage Bay as an attraction or destination if they chose to cross the road.

All action alternatives might result in small impacts to users of the trails and Wilderness due to distant views and sounds of harvesting, construction, and hauling activities. Use of these roads is not anticipated to change much as a result of implementing these alternatives. Potential opportunities for Kupreanof might be impacted, depending on the market segment of users they attracted to the area, and how purist they might be in their pursuits.

Cumulative Effects

All of the action alternatives would provide greater access to the area and shift the nature of the recreation experience from "primitive" to "roaded natural" and "roaded modified." The area would probably be used more than in the past for recreation purposes. Those users who currently value this area of north Kupreanof for its primitive or semi-primitive nature could be displaced if an action alternative is selected.

Wild and Scenic Rivers

Alternatives 1 (no action) and 3 are the only alternatives that would fully protect Duncan Salt Chuck Creek in its tentatively eligible status for Wild classification, and therefore its possible designation and inclusion in the National Wild and Scenic River System for the entire 12 miles of the eligible portion of the stream. For analysis, two river segments were considered: Segment 1, from the falls at the outlet of the Salt Chuck upstream to the Wilderness boundary, and Segment 2 from the Wilderness boundary upstream to Bohemia Lake. A detailed description of the suitability report for Duncan Salt Chuck Creek is included as Appendix E in this Draft EIS.

Designation

Wild

Segment 1, 3.9 miles within the Wilderness, could be designated as a Wild River and not affect any of the action alternatives. Segment 1 lies outside the analysis area boundary and is not affected by the proposed action.

Segment 2, if designated as a Wild River, would affect the implementation of proposed action alternatives 2, 4, 5, and 5A. Designation of Segment 2 as a Wild River would have the following effects:

1. Withdrawal from mineral entry; the absence of existing claims or known mineral resources indicate the withdrawal would likely have no significant effect on the availability of mineral resources.
2. Denial of the opportunity for future construction of a State highway connecting Kake and Petersburg within an existing identified corridor. Alternate routes, if available, would likely have higher maintenance and user costs and could increase impacts on soil and water resources.
3. No likely effect on future availability of water supplies or electric power since the area has no identified potential for power development and no existing power site withdrawals.
4. Increased access cost to timber resources on the Bohemia Range north and west of the river corridor and possible denial of access to timber on the west side of Portage Bay from the Goose Lake road (existing FR 6030).
5. Elimination of potential harvest on approximately 947 acres of suitable forest lands within the river corridor (1.57 MMBF); potential fish habitat enhancements could have higher costs associated with access and design, or development could be precluded.
6. Maintenance of current access and competition for subsistence resources.
7. Maintenance of the current primitive/semi-primitive recreation opportunities.
8. Preservation of the unmodified landscape within the river corridor. Visual quality outside the river corridor could be managed in accordance with adjacent land use designations. The visual quality objectives for these adjacent lands may recommend that management activities be designed to be unnoticeable or to appear only as minor disturbances.

Scenic

Segment 1: Designation of Segment 1 as a Scenic River would have no effects on the action alternatives since it is less restrictive than a Wild River designation which had no effect. Segment 1 lies within the Petersburg Creek-Duncan Salt Chuck Wilderness and is outside the analysis area.

Segment 2: If Segment 2 is designated as a Scenic River, all of the proposed action alternatives, 2, 3, 4, 5, and 5A could be implemented. Designation as a Scenic River would have the following effects:

1. It would allow for the future construction of the State highway on the planned location, with two road bridges across the river,
2. The future availability of water supplies or electric power would not be affected.
3. Segment 2 would remain open to mineral entry.
4. It would allow restricted timber harvest on 947 acres of suitable forest land within the ¼-mile-wide river corridor; harvest activities would utilize silvicultural treatments which would ensure compatibility with visual objectives for a Scenic River designation. Harvest activities on land outside the corridor are not affected by the designation.
5. It would allow typical fish enhancement projects, increasing the potential for increased fish production,
6. It could increase access for some subsistence uses and enhance semi-primitive and roaded recreation opportunities.
7. It would retain the visual character within the corridor as seen from the river, while adjacent areas are subject to visual quality objectives of the land use designations. The VQO's for these adjacent lands may allow management activities to be noticeable, but they should resemble natural landscape patterns.

Non-designation

Segment 1: Outstandingly remarkable fisheries, wildlife, scenic, and recreational values, concentrated in the Wilderness and already protected from commodity-oriented management activities, would not be adversely affected if the river were not designated.

Segment 2: Timber harvest on lands adjacent to the river corridor would likely be visible from the corridor; however, since scenic values were not outstandingly remarkable in Segment 2, river values are not affected. The stream side buffers required by the Tongass Timber Reform Act and the application of the best management practices adequately protect fish habitat and sport fishing values. Harvest of timber in Segment 2, subject to standards and guidelines, would reduce the primitive character of the area and may increase access for recreation and subsistence uses.

Cultural Resources

Cultural resource sites within the Bohemia Mountain analysis area may contain significant information on past environmental conditions and human lifeways, possibly including information related to past conditions along the north Pacific Rim. These sites are both fragile and non-renewable. Primary impacts can include alteration to the settings of sites; alterations of above ground objects, features and structures; as well as the spatial relationships among them; and disturbance or destruction of subsurface cultural deposits. Secondary impacts may include a higher frequency of site vandalism due to increased access from constructed roads.

Federal laws and regulations (particularly the National Historic Preservation Act of 1966, as amended; Executive Order 11593, "Protection and Enhancement of the Cultural Environment"; the Archaeological Resource Protection Act of 1979, as amended; and the American Indian Religious Freedom Act of 1978) require a process, specified in 36 CFR 800, for considering the impacts of Federal projects on cultural resources. In brief, this process, outlined in Section 106 of the National Historic Preservation Act, involves inventorying cultural resources, determining which are significant or eligible to the National Register of Historic Places, evaluating project effects, and designing and implementing measures to negate any adverse effects that projects may have upon significant resources. The process is undertaken in consultation with the Alaska State Historic Preservation Officer (SHPO) and possibly the Advisory Council on Historic Preservation.

The known sites in the analysis area are surrounded by buffers and will not be affected. It is more difficult, however, to predict the effects on sites that have not yet been identified. It is well documented that sea levels in the islands of southeast Alaska fluctuated throughout time. It is also apparent that the seashore and coastal environment was the focus of the activities of the people who have inhabited the area. Therefore, it appears as though past sea levels play an indicator role in locating aboriginal sites and that the key criterion for establishing probability zones for cultural resources is elevation above the present shoreline.

The current Forest-wide predictive model for cultural resources considers slope angle and elevation as the two primary environmental factors for establishing a high, medium or low probability for discovery of cultural resources. The elevation and slope angle figures used to delimit the probability zones are general guidelines.

The high probability zone is defined as all areas between sea level and 100 feet in elevation. The medium probability zone is defined as all areas between 100 and 1,000 feet in elevation, with slope angles of 30 percent or less. The low probability zone is defined as all areas between 100 and 1,000 feet with slope angles greater than 30 percent; all areas above 1,000 feet in elevation, regardless of slope angle; and muskeg areas. Normally, areas of high and medium probability will require a field inventory to identify significant sites, but it may be possible to recommend clearance on the basis of the results of a literature and files search.

Raven's Wrinkled Foot: A Cultural Resource Overview of Kupreanof Island (Rabich-Campbell 1988) presents a different cultural resource predictive model based on the results of a literature search and an examination of known and reported sites. The highest recorded site on Kupreanof Island, the Irish Creek Site, is about 50 feet in elevation above the present shoreline. Therefore, the high probability zone for Kupreanof Island is defined as all lands from sea level to 75 feet in elevation; the medium probability zone is all lands from 75 to 125 feet in elevation; and the low probability zone is all lands above 125 feet in elevation. Rabich-Campbell (1988;42)) also suggests that the north shore of Kupreanof Island has a relatively low site potential compared to the indented shoreline of the west and south shores of the island.

Generally, those alternatives which favor more development pose a greater threat to undiscovered cultural resources. An examination of Table 4-16 indicates that Alternative 5 offers the greatest chance of creating ground disturbance and potentially damaging undiscovered sites, followed in descending order by Alternative 5A, Alternative 4, Alternative 2 and Alternative 3. The "no action" alternative by its very nature would constitute the least threat to cultural resources.

Table 4-15. Ground Disturbing Activities.

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt.5	Alt. 5A
Specified Road Miles						
Existing	28.1	28.1	28.1	28.1	28.1	28.1
New Construction	0.0	13.8	1.4	18.6	28.9	19.2
Spur Road Miles	0.0	2.6	1.1	3.1	5.6	4.4
Acres of Harvest	0	830	367	871	1,416	1,270

This assessment differs, however, when the location of ground disturbance is compared to the predictive model proposed in the Kupreanof Island cultural resource overview. (Rabich-Campbell 1988). When ground disturbance is placed within the context of the cultural resource probability model it becomes apparent that none of the alternatives will affect the high probability zone for cultural resources. The implementation of a 500-foot beach fringe buffer zone and a 1,000 foot estuary buffer zone has effectively eliminated the high probability zone from consideration for road construction or timber harvest. Generally, all ground disturbance within the medium probability zones would be targeted for an intensive field inventory. A random selection of units in the low probability zone (usually about 5 percent of those units) would be targeted for inventory to validate the predictive model. Given this approach (field inventory of all medium probability units and 5 percent of low probability units), Alternative 5 offers the greatest chance of disturbing cultural resources, followed, in descending order, by Alternative 5A, Alternative 2, Alternative 3, and Alternative 4.

Table 4-16. Cultural Resource Probability Zones

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt.5	Alt. 5A
Acres in High Probability Zone	0	0	0	0	0	0
Acres in Medium Probability Zone	0	198	227	0	283	202
Acres in Low Probability Zone	0	776	157	1,040	1,352	1,254
Total	0	974	384	1,040	1,635	1,456

Before logging and other ground disturbing activities are undertaken in the selected alternative, Forest Service personnel will apply the probability model to inventory cultural resources. The Forest Service will evaluate the significance of any discovered cultural resources, determine potential project impacts and design and implement necessary specific measures to negate any effect on significant cultural resources. Such measures could include relocating or redesigning some timber management activities to avoid disturbing cultural resources, protecting sites through the use of physical barriers and recovering scientific data or otherwise documenting sites that cannot be avoided or protected. An inventory strategy and mitigation measures will be designed and implemented in consultation with the Alaska State Historic Preservation Officer to negate adverse project effects on significant cultural resources.

Cumulative Effects

Impacts from decay, natural landscape changes and development pose a threat to the preservation of significant cultural resources in the analysis area. Future timber harvest combined with other ground disturbing activities could result in a loss of cultural resources. Increased access to cultural resource sites also poses a potential threat from vandalism and looting. Previous cultural resource inventories indicate most if not all of the cultural resources are located within a short distance of the present shoreline. It is impossible, however, to determine the exact number and nature of cultural resources that are potentially threatened by future development. Maintenance of a 500-foot beach fringe and a 1,000-foot estuary protective buffer zone for future development will effectively lessen the potential impact to cultural resources. Implementation of field inventories and various mitigation measures will reduce the potential loss by preserving significant sites and by providing data on those that can not be preserved.

Visual Resource

Results of Chapter 3 analysis suggested the following general guidelines:

Visual quality objectives (VQO's) to be met by management activities should range from "partial retention" to "maximum modification", with the higher quality objectives being applied on those lands viewed from the ferry lane in Frederick Sound (1985-86 TLMP Amendment).

To avoid harvesting all the unseen CFL too quickly, at least 80 percent of the harvest in the Portage Bay VCU (442) and 30 percent of the harvest in the Bohemia Mountain VCU (424) should be in areas visible from sensitive viewpoints.

Proposed activities which overlap with sensitive seen area (Visual Management Classes 1 and 2) may need extra attention during project design and layout, particularly where past management activities are still evident nearby. This may include reshaping the unit boundaries, or requiring that unmerchantable trees be left standing for some distance inside the boundary to soften the harsh edge. Within-stand green tree retention would not be practical in most units of this study area due to high windthrow risk.

Each of the action alternatives is likely to satisfy basic TLMP direction for visual resource management. The visual condition likely to result from the proposed action would meet VQO's ranging from "preservation" to "modification" in areas seen from Frederick Sound and Portage Bay. Some harvest would be seen from within the Wilderness on the Portage Mountain Loop trail; both Bohemia Mountain and the slopes east of Portage Bay are seen as middle and background.

Alternative 1

Portage Bay VCU: 88 percent of existing managed timber stands are visible.

This alternative would cause no additional visual impacts within the analysis area. Approximately 4 percent of the seen area in the entire Portage Bay VCU appears modified by existing managed stands, which are located east of Portage Bay. (Older managed stands on the western shores of Portage Bay are no longer visually obvious to a casual observer.) See figure 4-6.

The landscape **east of Portage Bay** would be allowed more time to visually recover from 1984 management activities before another entry is made. Existing units in Portage Bay currently meet a "partial retention" VQO. Approximately 7 percent of the seen area east of Portage Bay is visually modified by timber management activities at this time, and will remain in a visually modified condition for the next 20 years.

The landscape **west of Portage Bay** would be maintained in a visual condition of "preservation," contrary to the management possibilities offered by the inventory VQO's of "partial retention" and "modification."

Alternative 2

Bohemia Mountain VCU: 24 percent of proposed harvest acres would be seen.
Portage Bay VCU: 91 percent of proposed harvest acres would be seen.

This alternative would visually affect Portage Bay, with minor visual impacts on Frederick Sound. An additional 4 percent of the seen area in the Portage Bay VCU, and 1 percent of the seen area in the Bohemia Mountain VCU would be modified by proposed harvest units. See Map 4-2 and Figure 4-6.

East of Portage Bay, the combined effects of past and proposed activities to the east would likely maintain an appearance of "partial retention" for most of the seen area. New units would be noticeable from saltwater, but visible portions would be small in size, similar to the visual effects of existing units. Most units have been placed south of Stop Island in this entry to allow existing managed stands near the head of the bay more time to visually recover. As a result, harvest south of Stop Island may be more consistent with a "modification" VQO, while persons anchored near the mouth of the bay would experience visual conditions consistent with "partial retention". Approximately 14 percent of the seen area east of Portage Bay would appear modified by past and proposed management activities.

To the **west of Portage Bay**, proposed units would likely meet a "modification" VQO. Two units would be seen (units 210 and 211) high on the slope. These units would be seen at an angle from anchorages near the mouth of Portage Bay. Due to their size, shape and proximity to each other, they would appear as unnatural patterns until the regenerating trees reach mature height.

Some harvest on Bohemia Mountain and in Portage Bay may be visible from **Frederick Sound**, but would be seen at an angle. Part of helicopter unit 215 would be seen from Frederick Sound. The cumulative effect of proposed and past harvest would likely meet a "retention" or "partial retention" VQO from Frederick Sound.

Alternative 3

Portage Bay VCU: 91 percent of proposed harvest acres would be seen.

This alternative would visually affect Portage Bay, with fewer impacts to Frederick Sound than described for Alternative 2 because entry into the Bohemia Mountain VCU is deferred. An additional 4 percent of the seen area in the entire Portage Bay VCU would be modified by proposed harvest units. See Map 4-3 and Figure 4-6.

Visual impacts **east of Portage Bay** would be the same as those described for Alternative 2.

The landscape **west of Portage Bay** would be maintained in a visual condition consistent with a VQO of "preservation", contrary to the management possibilities offered by the inventory VQO's of "partial retention" and "modification".

Some harvest in Portage Bay may be visible from **Frederick Sound**, but would be seen at an angle. Part of helicopter unit 304 would be seen from Frederick Sound. The cumulative effect of proposed and past harvest would likely meet a "retention" or "partial retention" VQO from Frederick Sound.

Alternative 4

Bohemia Mountain VCU: 49 percent of proposed harvest acres would be seen.

This alternative would have a visual impact on Portage Bay and Frederick Sound due to harvest in the Bohemia Mountain VCU. Approximately 3 percent of the seen area in this VCU would be visually modified. See Map 4-4 and Figure 406.

The landscape **east of Portage Bay** would be allowed more time to visually recover from 1983 timber management activities before another entry is made.

To the **west of Portage Bay**, proposed harvest is likely to result in a visual condition of "modification." Small portions of 8 units would be seen. Unit 414 would be the most eye-catching unit as seen from anchorages near the mouth of Portage Bay. This unit reaches higher on the slope and is squarer in shape than adjacent units.

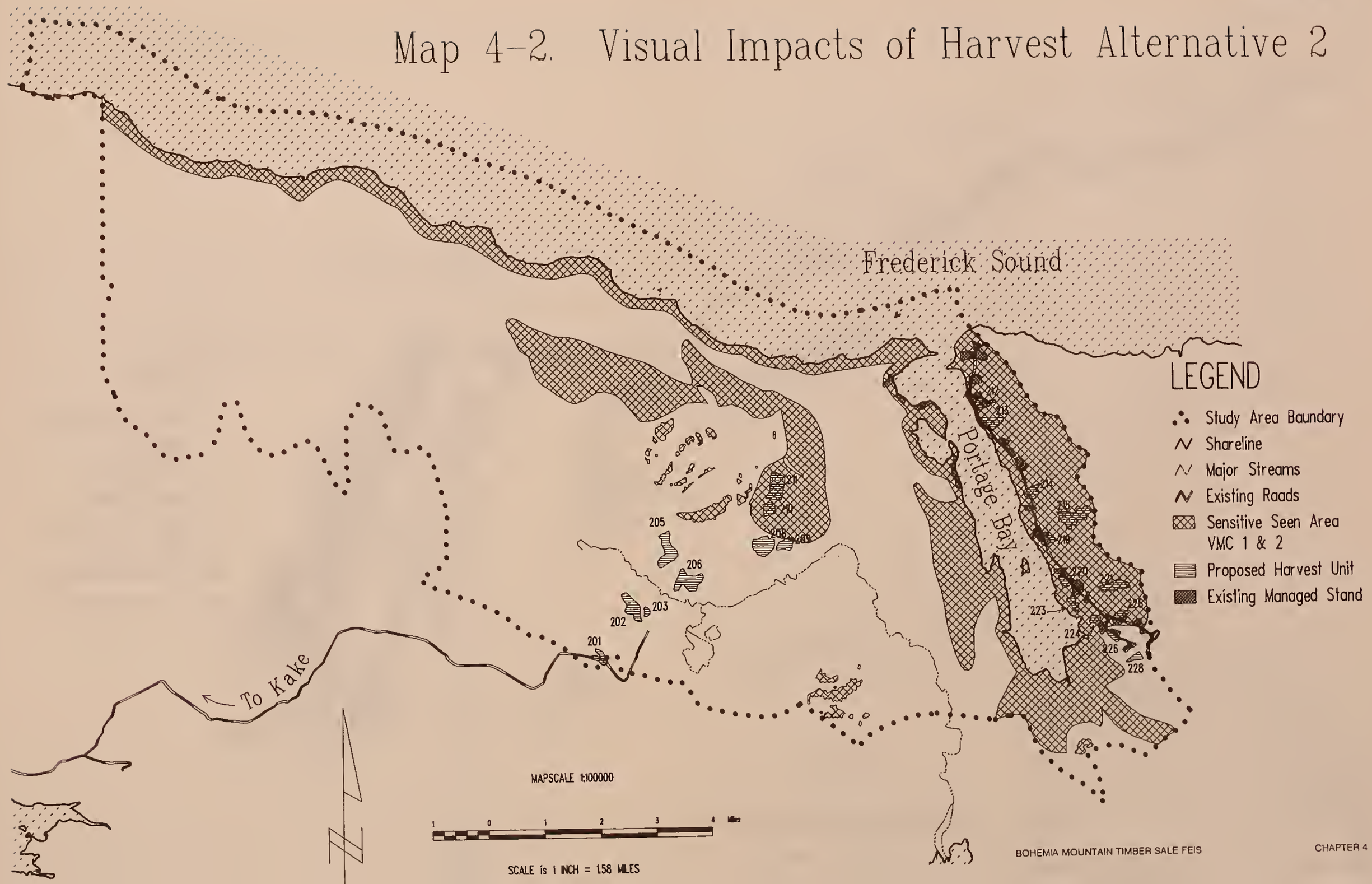
Visual impacts to **Frederick Sound** would likely result in an appearance of "modification". Five units would be visible, with units 414 and 416 being the most visually dominant due primarily to their size.

Alternative 5

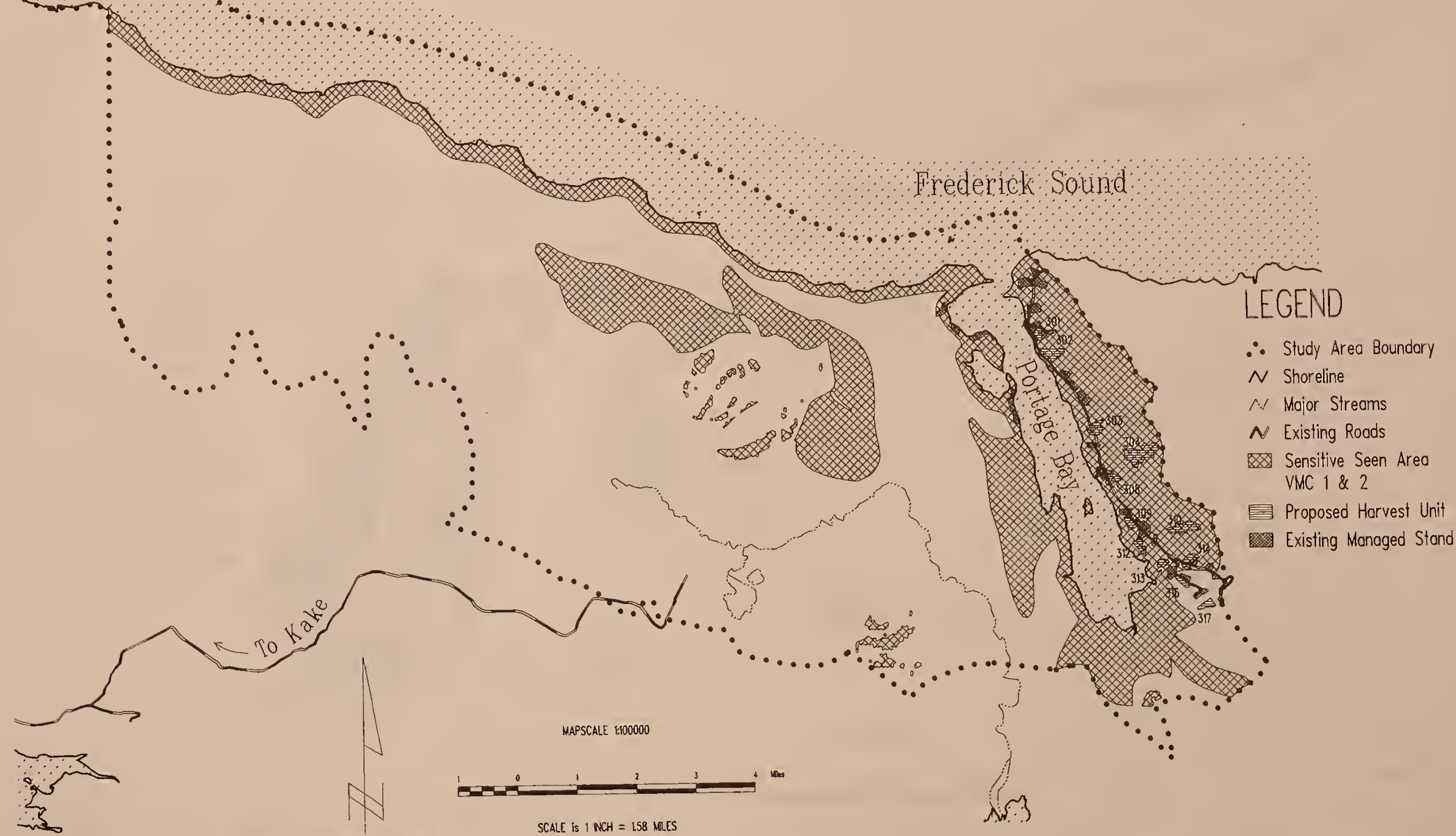
Bohemia Mountain VCU: 47 percent of proposed harvest acres would be seen.
Portage Bay VCU: 77 percent of proposed harvest acres would be seen.

This alternative would visually impact Portage Bay to a slightly greater degree than Alternative 3. Impacts to Frederick Sound would be similar to those described in Alternative 4. An additional 4 percent of the seen area in the entire Portage Bay VCU, and 4 percent of the seen area in the entire Bohemia Mountain VCU would be modified by proposed harvest units. See Map 4-5 and Figure 4-6.

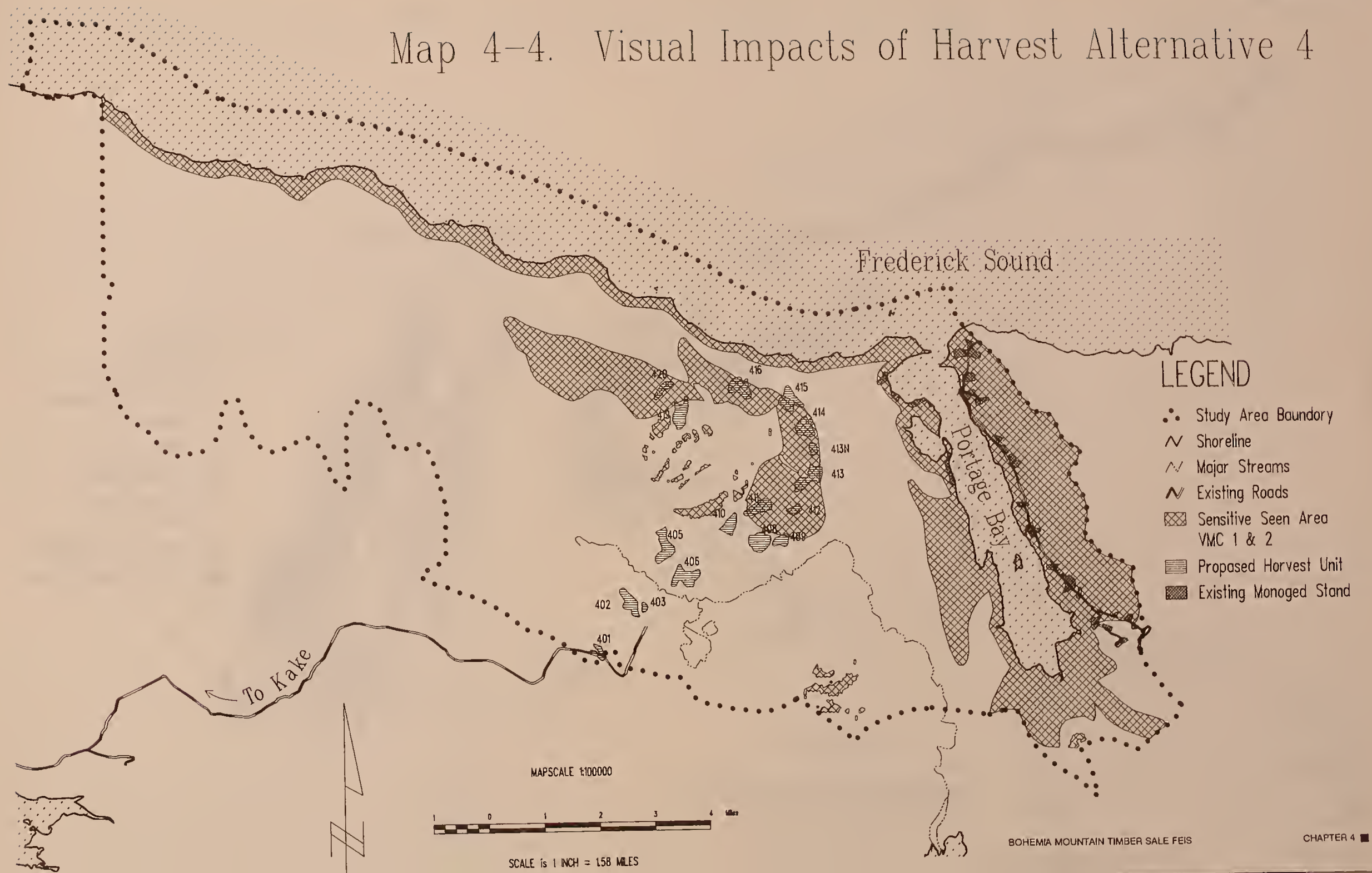
Map 4-2. Visual Impacts of Harvest Alternative 2



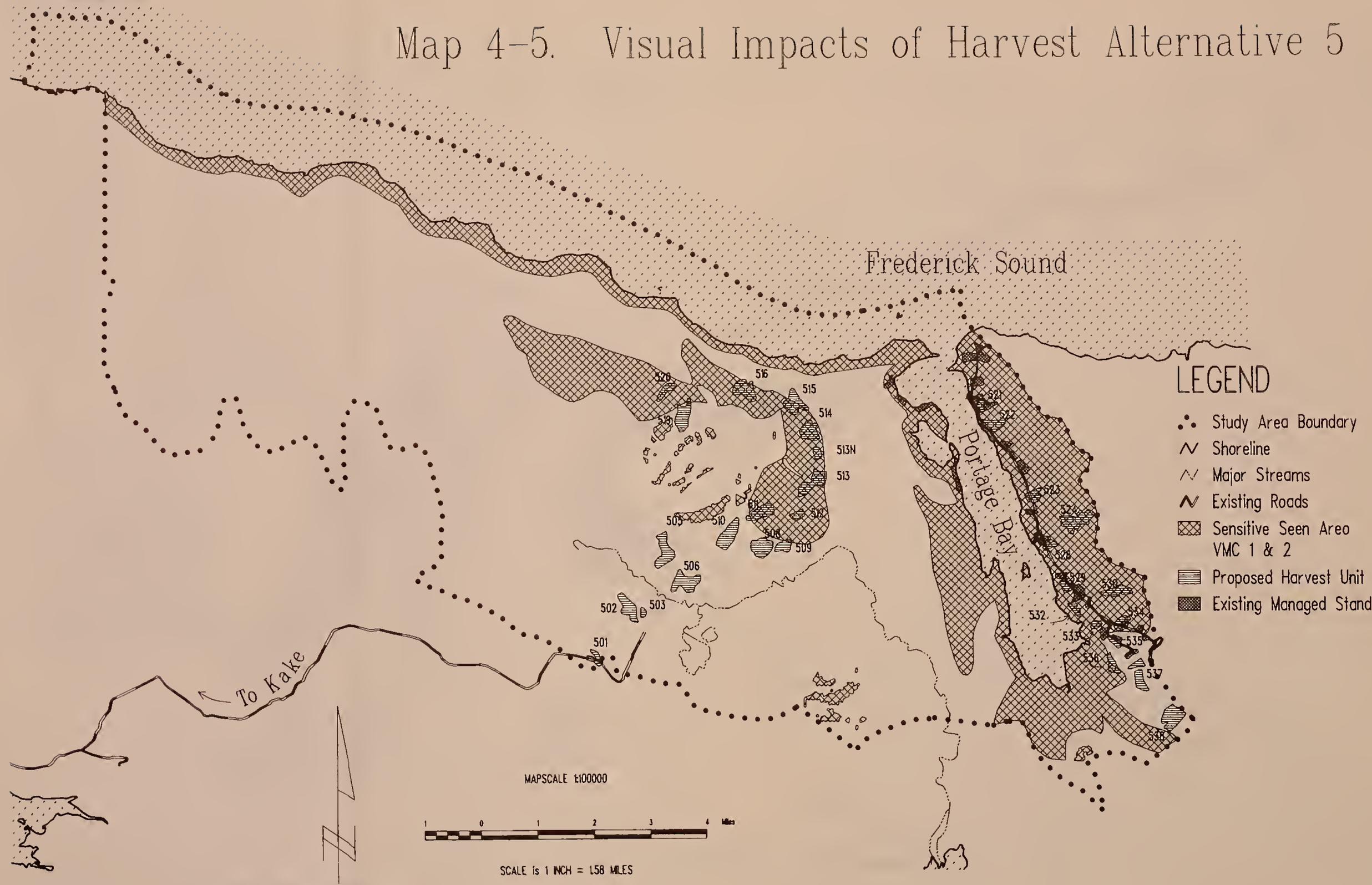
Map 4–3. Visual Impacts of Harvest Alternative 3



Map 4-4. Visual Impacts of Harvest Alternative 4



Map 4–5. Visual Impacts of Harvest Alternative 5



Map 4-6. Visual Impacts of Harvest Alternative 5A

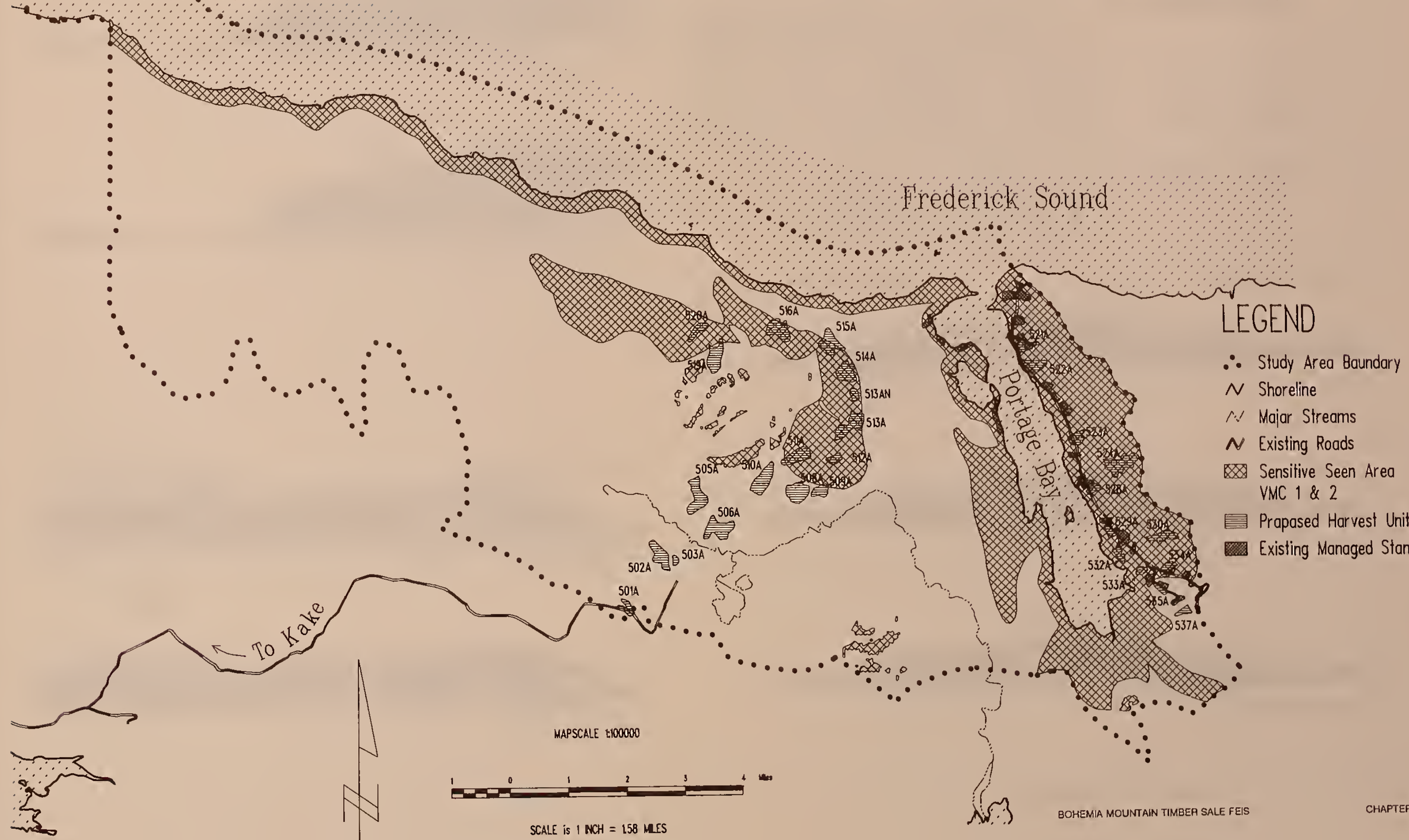


Figure 4-6. Computer Generated Views of Bohemia Mountain Study Area

1⊕ Viewpoint 1, Portage Bay

2⊕ = Viewpoint 2, Portega Bay

⊕3 = Viewpoint 3, Fraderick Sound

Viewpoint locations

Viewpoint 2, Portage Bay

View of Missionary Range

Alternatives 1 and 4

Alternatives 2, 3, 5, and 5A

Viewpoint 1, Portege Bay

View of Bohemie Mountain

Alternetives 1 and 3

Alternative 2

Alternetives 4, 5, end 5A

Viewpoint 3, Frederick Sound

View of Bohemia Mountein

Alternatives 1, 2, and 3

Alternatives 4, 5, and 5A

Visual impacts **east of Portage Bay** would be the same as those described for Alternatives 2 and 3, except that several additional units would be visible to the southeast of the head of Portage Bay. One of these units (538) would likely be highly visible from the Portage Mountain Loop trail, and may be seen at an angle from anchorages near the mouth of Portage Bay. The cumulative effects of past and proposed management activities would likely result in a visual condition of "partial retention" near the mouth of the bay, and "modification" near the head. Approximately 16 percent of the seen area east of Portage Bay would appear modified by these activities.

Visual impacts **west of Portage Bay** would be the same as those described for Alternative 4.

Visual impacts to **Frederick Sound** would be the same as those described for Alternatives 3 and 4.

Alternative 5A

Bohemia Mountain VCU: 47 percent of proposed harvest acres would be seen.
Portage Bay VCU: 91 percent of proposed harvest acres would be seen.

This alternative would visually affect Portage Bay and Frederick Sound to a similar degree as Alternatives 3 and 4 combined. An additional 4 percent of the seen area in the entire Portage Bay VCU, and 3 percent of the seen area in the entire Bohemia Mountain VCU would be modified by proposed harvest units. See Map 4-6 and Figure 4-6.

Visual impacts **east of Portage Bay** would be the same as those described for Alternative 2.

Visual impacts **west of Portage Bay** would be the same as those described for Alternative 4.

Visual impacts to **Frederick Sound** would be the same as those described for Alternatives 3 and 4.

Additional Consequences Common to all Action Alternatives

Roads

New roads proposed near **Portage Bay** would produce little or no additional visual impacts with one exception. Road access to unit 538 in Alternative 5 would be seen from Portage Bay and the Portage Mountain Loop Trail. Its position high on the slope has potential to attract attention.

Proposed roads along the east and north slopes of **Bohemia Mountain** would produce relatively low visual impacts for Portage Bay and Frederick Sound with a few exceptions. Generally, most proposed roads are located at the base of steeper slopes where downslope trees outside the unit would help screen the road. However, road access to unit 520A (aka 520 and 420) would be visible from Frederick Sound, and roading in units 211 and 511A (aka 210, 411, 511) would be visible from Portage Bay due to their positions high on the mountain. Rock is expected to be dark in color. Regeneration within the units would likely screen visible portions of road within approximately five to ten years.

Proposed roads along the south side of Bohemia Mountain are likely to be visible from the Bohemia Lakes, part of the Duncan Creek system being considered for Wild and Scenic River designation. However, these lakes are not currently inventoried as visually sensitive recreation sites due to their low recreation use levels. The inventory VQO for the slopes seen from Bohemia Lakes is "modification." Proposed harvest and roading would likely meet a "modification" VQO as planned. If Alternative 5 is selected with the Kake/Portage road connection, recreational use in the area may increase, necessitating a change in inventory VQO's for the road's viewshed.

Rock Pits
Landscape design principles would be applied in locating and designing rock pits in sensitive seen areas (VMC's 1 and 2).

Log Transfer Facility Use
No new log dumps would be needed. Use at existing LTF's is not expected to alter their current visual condition, unless a new sort yard is closely associated with them.

Sortyards
If an additional sortyard is required, landscape design principles would be used during location and layout, to reduce visual impacts on nearby sensitive travel routes.

Cumulative effects over time

Portage Bay VCU (422)
Cumulative visual impacts from past and proposed timber management would likely affect approximately 14 percent of the seen area east of Portage Bay (7 percent of the entire VCU). A visual condition of "partial retention" for the area north of Stop Island is likely to result from this entry. The cumulative impacts after proposed harvest south of Stop Island is likely to meet a "modification" VQO. Future entries, assuming they continue to occur at approximately 10-year intervals, would affect from 13 percent to 17 percent of the seen area east of Portage Bay at any one time throughout the remainder of this rotation. This level of timber management could produce a visual condition of "modification" with the next entry, depending on unit size, shape, spacing and placement on the slope (elevation). Additional impacts would occur to the Portage Bay viewshed with continued harvest on Bohemia Mountain slopes seen from Portage Bay and with the harvest of blowdown timber as it occurs.

Bohemia Mountain Value Comparison Unit (424)
Visual impacts of first entry timber harvest on Bohemia Mountain would likely affect approximately 3 percent of the seen area within the entire VCU. A visual condition of "modification" is likely to result from this entry. If future entries occur at 10-year intervals, approximately 10 percent of the seen area would be affected at any given time throughout the rotation. This level of harvest would likely produce a visual condition ranging from "partial retention" to "modification," depending on unit size, shape, spacing, and placement (elevation) on the slope. Additional impacts would occur with the harvest of blowdown timber as it occurs. If blowdown in subsequent harvests takes place within some of the narrow leave strips, a "modification" to "maximum modification" appearance could result.

If the Kake/Portage road connection is constructed and receives steady recreational use, the viewshed of this travel route would need to be remapped and managed according to its new sensitivity level. This would affect future timber management on the south side of Bohemia Mountain.

Minerals

In order to obtain construction materials for roads described in the action alternatives, rock quarries would be developed at points along the road. Mining interests could examine the exposed rock formations to more accurately estimate the minerals potential of the area. Alternative 5 would expose the greatest area for examination, followed by Alternative 5A, 4, 2, and 3. The helicopter units would not require road construction. There are no known valuable minerals occurring in the Bohemia Mountain analysis area.

Timber Economics

The purpose of an economic analysis is to provide a means by which short-term costs and revenues for each alternative can be compared. In this analysis, the net value of each alternative was derived by subtracting all production costs, an amount which includes an allowance for profit and risk, from end product selling values. This economic analysis is done for the purpose of relative rankings of the alternatives only. Actual timber values and costs at the time of the sale may deviate from the numbers displayed in the alternative comparisons.

Timber markets vary during the timespan between planning and actually selling a timber sale. Timber values can change by as much as $200 per thousand board feet during this period. Due to these market variations, the estimate of timber end-product selling value was based on a median or middle level of the timber market.

Manufacturing costs were then subtracted to determine "pond log value," or what the log is worth before processing. In addition, to test whether the sale would constitute an economic offering, an allowance for 60 percent of normal profit at the middle market level was included in determining the timber value. Woods production costs were then subtracted from this value in Table 4-17 to arrive at the total net value of each alternative. Table 4-17 also shows costs and values in dollars per thousand board feet to highlight differences between alternatives.

Table 4-17. Timber Values and Costs to an Operator of Average Efficiency

Economic Factor	Alt.1	Alt.2	Alt.3	Alt.4	Alt.5	Alt.5A
Value ($/MBF)*	0	239	235	244	243	241
Costs ($/MBF): Stump-to-Truck	0	160	164	155	156	159
Specified Road	0	82	7	126	112	80
Spur Road	0	7	5	11	11	9
Truck Haul:	0	11	2	31	12	20
Water Haul	0	24	25	27	26	26
Total Costs:	0	284	203	350	317	294
Net Value ($/MBF):	0	-45	32	-106	-74	-53

* Timber value in $/MBF is pond log value minus 60% normal profit and risk.

Production costs exceeded timber values in four out of five of the action alternatives. The primary reasons why costs were higher than values are the large percentages of volume class 4 and 5, 47 and 42 percent respectively, on operable Commercial Forest Land (CFL), in the Bohemia/Portage area and the amount of specified road required to gain access to the proposed harvest units. Timber values increase with increasing volume class while stump-to-truck costs decrease with increasing volume class. For example, volume class 4 has lower timber values than volume class 5 but has higher stump-to-truck costs. The volume class mix varied somewhat between alternatives, which resulted in a slight difference in timber value per thousand board feet (MBF). Table 4-18 displays acres harvested by volume class for each alternative. The difference in stump-to-trucks costs between alternatives is primarily a function of two factors; relative amount of volume logged with helicopter, and volume class mix. Alternative 3 has the highest stump-to-truck cost per MBF because it has a higher percentage of volume harvested with helicopter than the other action alternatives.

Table 4-18. Acres Harvested by Volume Class for Each Alternative

Volume Class	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A	Existing Managed Stands
4	123	8	218	230	225	27
5	548	241	636	1,033	910	199
6	159	118	17	153	135	156
Total	830	367	871	1,416	1,270	382

The cost of specified road for each alternative which harvests timber on Bohemia Mountain has been displayed (Table 4-17). The route would be built on the south side of Duncan Salt Chuck Creek and would cross the stream twice. One effect of building the road on the south side is to benefit future transportation needs, although it will cost more to gain access to the timber at this time. The main difference in haul cost is in alternative 5; this alternative builds the road from Bohemia Mountain to the Portage Bay transportation system. This allows a significant savings in haul distance and haul cost when compared to the other alternatives which haul the timber from Bohemia Mountain to the Little Hamilton log transfer facility (LTF).

Economic analyses were conducted for the analysis area, under the assumption that alternatives with a negative return would be implemented if selected, to predict the relative values of future harvest entries. The results of the analyses indicate that future sale offerings have the potential to harvest a majority of the remaining operable CFL in the analysis area with a positive return to the Government.

Alternative 3 is the only alternative that is expected to produce an immediate short term positive cash return to the government. This alternative has the advantages of an existing road system, short truck haul distance and slightly higher timber values. Alternatives 2, 3, 5, and 5A all include approximately 134 acres which will be helicopter logged. These units are located across the upper slopes of the west side of Missionary Range. The remaining units in all alternatives will be logged using highlead, skyline, and shovel systems.

The stump-to-truck costs for helicopter logging are approximately $45 per MBF higher than for cable, but this is somewhat offset by the fact that no additional road is needed for the helicopter volume.

For timber economics, the greatest real difference between alternatives is in the cost of road per thousand board feet harvested. This difference is due to the varying volume of timber harvested per mile of road built in each alternative. Alternative 3 harvests the most timber relative to the amount of specified road construction, so the road cost per MBF is the lowest. It also has the highest spur road cost per MBF due to the total amount of timber harvested and the total cost of spur road construction.

It must be remembered that these values and costs may differ from the final appraised rates. They are used here to provide an economic basis for comparing the alternatives. During periods of better than average timber values, the return to the government could be positive.

Employment

The number and value of jobs provided by the harvesting and processing of timber on the Bohemia Mountain analysis area is based on the following assumptions:

1. Seven jobs are generated per million board feet of timber harvest.
2. The value of each job is $33,000 per year.
3. The secondary benefit of dollar return to communities is a seven-to-one ratio of the direct job value.

Alternative 5 would generate the most jobs, followed by Alternatives 5A, 2, and 4 (see Table 4-19). Alternative 3 would generate the fewest jobs.

Table 4-19. Number and Value of Jobs Generated by a Bohemia Mountain Timber Sale.

Job Factor	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt.5A
Number Jobs Generated	0	168	85	146	267	237
Dollar Value (million $)	0	5.54	2.81	4.82	8.81	7.82
Secondary Dollar Value (million $)	0	38.78	19.67	33.75	61.67	54.74

Cumulative Effects

Selection of one of the action alternatives would contribute to the continued viability of the timber industry in southeast Alaska and the continued socio-economic stability of southeast Alaska communities. Selection of the no action alternative would not contribute to job or community stability.

Transportation

Forest roads in the Bohemia Mountain analysis area are classified as either specified or spur roads. The differences are related to the length of service life and the need for control of the road construction process.

Specified Roads

All proposed specified roads would be developed and operated for long term land management. As a part of the forest development road system, specified roads serve as primary transportation links in the sale area. They provide access to each of the harvest units and link the units to the log transfer facility. Following the initial entry described in this Draft EIS, specified roads would also be used in future timber harvest entries, for recreation access, and for ongoing silviculture activities such as stocking surveys and precommercial thinning. Their location and design is specified by the Forest Service.

Spur Roads

Spur roads are road segments that go from the specified road into the harvest units and the sort yard. Following the initial entry, water bars will be installed on spur roads, and spur roads will be allowed to grow back, most likely to alder and spruce. Feasible spur locations are suggested by the Forest Service but the contractor may choose alternative routes subject to Forest Service approval. Approval is dependent on a location consistent with the same or less impact than the preferred alternative.

Cumulative Effects

The impacts of road construction on the Bohemia Mountain analysis Area are related to the following factors:

The length and location of roads: Specified roads, while providing access, remove some land from timber production and wildlife habitat while in use. Some erosion can be expected as a result of the construction, operation, and maintenance of the roads. (See the Fisheries section for discussion of consequences).

All soil exposed during construction will be grass seeded, and within a few years will not contribute significantly as a sediment source. These grassed roadbanks will be used by wildlife. Spur roads will be closed by removing culverts, installing water bars, and allowing alder to grow over the roadbeds. Since the cutbanks of these roads are seeded and the roadbeds themselves allowed to revegetate, spurs should not provide a source of sediment until they are used again to harvest the second-growth in approximately 100 years.

The most noticeable impact from road construction is the physical alteration of the landscape. The extent of this depends on the terrain on which the road is built. For example, gentle ground often requires no excavation, only rock overlay; very steep ground requires full bench excavation and end haul of excess material.

Road density: Generally speaking, the higher the road density, (defined by the number of miles of forest development road in a square mile) the higher the risk of environmental impacts. These risks are minimized and mitigated by standards and guidelines which direct the road location, design, construction, and operation. Table 4-20 displays projected road densities for each alternative.

Table 4-20. Transportation Road Densities by Alternative.

Road Network	Alt.1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Bohemia Network	0.18	0.39	0.18	0.48	0.54	0.48
Portage Bay Network	0.71	0.73	0.73	0	0.81	0.73

The clearing widths required for forest road development are dictated by the steepness of the terrain and the road design standard. Steeper terrain with high design standards generally produces wider clearing limits resulting in a greater number of acres cleared. Clearing limits can be modified, within the limits of driver safety, when the road parallels fish streams and beaches. Table 4-21 compares road clearing acres by alternative.

Table 4-21. Road Construction Clearing Acres by Alternative

Road Network	Alt.1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Bohemia Network	63	140	63	171	194	171
Portage Bay Network	45	53	53	45	85	53

The number of stream crossings and the amount of road constructed near streams: The construction of culverts and bridges may cause some erosion of sediment into the creeks when and where construction takes place. This will be a short term impact, and mitigation measures will help offset the effects. Culverts on specified roads will be left in place after harvest is completed.

Number and location of rock pits required for construction materials: Rock pits remove land from timber production and are a long term impact.

Location of log transfer facility (LTF): A log transfer facility provides long term access to the area because it is the easiest point of entry not only to timber sale operations but also in the case of Portage Bay, to future recreation users. The existing facilities at Little Hamilton Bay or Portage Bay will be used for this timber sale.

Whether or not the road system connects with any other road system: In Alternative 5, the Kake Network, specifically Forest Development Road 6030, would be connected to the Portage network. In the other action alternatives, a portion of road 6030 would be constructed, increasing the likelihood of a possible connection at a later date. This could possibly encourage the State to eventually make a decision to construct the next link to Petersburg. Private passenger vehicle use is anticipated on these roads, although it would most likely be light due to the length of day trips to recreate, etc.

There are impacts associated with developing a Kake/Portage road connection. They include:

- Allowing transportation of vehicles between Portage Bay and Petersburg via the Alaska Marine Highway System and the completed road,
- Improving access to the Forest Service administrative site and the logging camp at Portage Bay,
- Benefiting businesses in Kake since some shopping by residents of Portage Bay would likely occur,

Camp at Portage Bay

- Enhancing Forest Service multiple use management, including sale administration and other project work because crews could use the Portage Bay administrative site,
- Increasing vehicle accessibility to Portage Bay for other management activities,
- Providing future timber management flexibility for using both log transfer facilities,
- Increasing Kake Tribal Corporation's willingness to bid on National Forest timber sales,
- Increasing roaded recreational opportunities in the Portage Bay and Bohemia Mountain areas,
- Providing trailhead opportunities for access into the Wilderness area from a road,
- Possibly decreasing opportunities for Wilderness-based cottage industries for the City of Kupreanof,
- Potentially increasing pressure on subsistence use of the area,
- Changing the primitive and semi-primitive nature of the road corridor
- Increasing the potential for more visitors to the area, with the attendant increase in the likelihood for loss of solitude, and
- Increasing sport fishing and hunting opportunities and competition.

Every effort has been made to locate roads to avoid slope stability problems, provide stable low-impact stream and drainage crossings, and minimize construction and haul costs. Natural conditions of the landscape will be altered by construction and, depending on the nature of rock sources, may create contrasting soil color. This may be noticeable on roads constructed on the mid-slope of steep ground.

Energy Requirements

The amount of energy needed to implement the harvest of timber under each alternative is based on the following asssumptions:

1. The rate for timber sale preparation and administration is 0.5 gallon per thousand board feet.
2. The rate for high-lead logging is 2 gallons per thousand board feet.
3. The rate for loading and hauling by truck and for water transport is 8 gallons per thousand board feet.
4. The rate for road construction is 4,000 gallons per mile.
5. The rate for road maintenance is 20 gallons per mile.
6. For the helicopter units, a Bell 214B helicopter would use 160 gallons per hour and would yard 20,000 board feet per hour (8 gallons per thousand board feet).

Table 4-22 shows the energy used for each action alternative:

Table 4-22. Estimated Fuel Consumption for Each Alternative on the Bohemia Timber Sale.

Fuel Consumption	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 5A
Thousands of gallons	0	294	124	283	498	416
Average gallons/MBF	0	12	10	14	13	12

List of Preparers

List of Preparers

Members of the interdisciplinary team (IDT) responsible for conducting the Bohemia Mountain Study Area analysis and for preparing the Environmental Impact Statement are listed alphabetically below:

Robert C. Aiken *Transportation planner*	B.S. Forest Engineering 9½ years experience
Samuel H. Carlson *Civil Engineer*	B.S Forest Engineering 1½ years government 6 years private forestry
Mary Clemens *Receation and Lands Forester*	B.S. Forest Management 10 years experience
Robert Dalrymple *Supervisory Forester*	B.S. Forest Management 8 years experience
Robert Daniels *Wildlife Biologist*	B.S. Wildlife Management 20 years experience
John Edgington *Fisheries Biologist*	B.S. Game Management M.S. Fisheries Management 30 years total experience (1 year Forest Service) 19 years Alaska Department of Fish and Game
Ron Freeman *Recreation Specialist*	B.S. Forestry 14 years experience
Charlotte Greenfield *GIS Programmer Analyst*	B.S. Psychology 13 years experience
Susan Hardin *Writer/Editor*	B.A. English 7 years experience in English education
Dave Helmick *Transportation Planner*	22½ years experience
Mark Hummel *NEPA Coordinator*	B.S. Natural Resources, M.S. Natural Resource Policy and Management 3½ years experience

Richard Jennings *Silviculturist*	B.S. Forestry 13 years experience
Carol Jensen *Landscape Architect*	B.S. Landscape Architecture 5½ years experience
Karryl Johnson *Fisheries Biologist*	B.S. Fisheries 1 year experience
Gail Johnejack *Hydrologist*	B.S. Wildland Watershed Management 5½ years experience
Merrily Jones *Public Affairs Specialist*	B.A. English 14 years experience
Everett Kissinger *Soils Scientist*	B.S. Soil Science 12½ years experience USDA Forest Service 10 years experience USDA Soil Conservation Service
Tamara S. Malone *Forester* *Team Leader (Final EIS)*	B.S. Natural Resource Management 10½ years experience
Mark McCallum *Archaeologist*	B.A. Anthropology 11½ years experience
Renaker D. Parks *Forester*	B.S. Forestry 11 years experience ½ year experience USDA Forest Service
Larry Roberts *Subsistence Coordinator*	B.A. Archaeology 15 years experience
Patricia Rogers *GIS Technician*	10 years cartographic work Oil and Gas Co. 3 years experience USDA Forest Service
Teresa Rockne *GIS Technician*	B.S. Secondary Ed./Health 4 years experience
James Schramek *GIS Coordinator*	B.S. Forestry M.S. Forest Hydrology 15 years experience

Andrew Wilson *GIS Analyst*	B.S. Forestry M.S. Forest Economics 9 years experience
Michael Wolanek *Hydrologist*	B.S. Forest Management M.S. Forest Hydrology 3½ years experience

List of Agencies, Organizations and Persons to Whom Copies of this Statement were Sent

List of Agencies, Organizations and Persons to Whom Copies of This Statement Were Sent

The following organizations and individuals are on the mailing list to recieve the Final EIS:

State Agencies
Alaska Department of Environmental Conservation (1)
Alaska Department of Fish and Game (1)
Alaska Department of Natural Resources (1)
Alaska Division of Governmental Coordination (10)

Federal Agencies
Federal Agency Liaison Division, Washington, D.C. (5)
U.S. Environmental Protection Agency, Alaska Operations Office, Juneau (1)
U.S. Environmental Protection Agency, Seattle (5)
U.S. Department of Interior, Office of Environmental Project Review (18)
U.S. Fish and Wildlife Service, Juneau (1)
U.S. Fish and Wildlife Service, Anchorage (1)
U.S. Forest Service, Alaska Regional Office, Juneau (30)
U.S. Forest Service, Washington Office, Washington, D.C. (5)
U.S. Forest Service, Chatham Area (5)
U.S. Forest Service, Chugach National Forest (5)
U.S. Forest Service, Petersburg Ranger District (20)
U.S. Forest Service, Stikine Area Supervisor's Office (30)

Organizations (1 each)
Alaska Geographic Society
Alaska Loggers Association
Alaska Timber Corporation
Alaska Center for the Environment
Alaska Trollers Association
Alaska Pulp Corporation
American Rivers
City of Kake
City of Kupreanof
City of Petersburg
City of Wrangell
Colorado State University- Documents Department
Kake Tribal Corporation
Mitkof Lumber Company, Haines
Narrows Conservation Coalition
National Marine Fisheries
Organized Village of Kake
Petersburg Chamber of Commerce

Petersburg Conservation Society
Petersburg Fish and Game Advisory Committee
Petersburg Indian Association
Petersburg Pilot
Petersburg Public Library
Petersburg Vessel Owners Association
Reid Brothers Logging Company
Sierra Club Legal Defense Fund
Soderberg Logging & Construction
Southeast Alaska Conservation Council
Southeast Alaska Seiners
Wrangell Forest Products Limited
Wrangell Public Library

Individuals (1 each)
Dixie M. Baade
Dave and Kerry Beebe
Kurt Flynn
Honorable Lonnie Anderson
Honorable Cheri Davis
Honorable Lloyd Jones
Honorable Robin Taylor
Kurt and Diane Hoelting
Michael Jackson
Becky Knight
Don and Barbara Koenigs
Victoria McDonald
Harold Medalen
Michael Medalen
Ted Morrison
Larry Morse
Samuel Rabung
Charles P. Van Epps
Harry E. Wilson

Glossary

Glossary

Alaska National Interest Lands Conservation Act (ANILCA)
Passed by Congress in 1980, this legislation designated 14 national wilderness areas in southeast Alaska.

Anadromous
Refers to those fish, usually salmonids, that spawn (some also rear) in freshwater and mature in saltwater.

Aquatic Habitat Management Unit (AHMU)
An area of stream and associated streamside habitat having fish values of such importance that land use activities will be prescribed to meet the management goals for fish habitat.

Beaver slide
A nonviolent system of placing logs into the water at a log transfer facility.

Buffer Zone
An area surrounding a special feature in order to protect it from development.
eagle nest trees: 330-foot radius around eagle nest trees
cultural sites: as needed

Carrying Capacity
The number of animals that an area can maintain in a healthy condition.

Commercial Forest Land (CFL)
Commercial forest land is land that can produce at least 8,000 board feet of timber per acre in one hundred years.

Cultural Resource
Any evidence of mankind's activities and behavior; includes data from archeology, architecture, ethnology, and history.

Dispersed Recreation
Outdoor recreation use occurring outside a developed recreation site; includes such activities as scenic driving, hunting, backpacking, and boating.

Distance Zones
Landscape areas denoted by specific distances from the observer, and characterized by the level of detail apparent in the subject.

Foreground: The detailed landscape within 0 to 1/4-1/2 mile of the viewer. Individual leaves and branches provide coarse texture.

Middleground: The area located within 1/2 to 3-5 miles of the viewer. Individual trees and tree groupings provide texture and form.

Background: The area within 3-5 miles to infinity of the viewer. Texture becomes indiscernible; shapes and washes of color become more dominant than texture.

Escapement Counts
When fish return to small streams to spawn, some are captured by fishermen. Those that escape being caught make up the escapement count.

Estuary
For purpose of this EIS process, estuary refers to the relatively flat, intertidal, and immediate upland areas, generally found at the heads of bays and mouths of streams. They are predominantly mud and grass flats and unforested except for scattered spruce or cottonwood.

Floodplain
The lowland and relatively flat areas joining inland and coastal waters, including debris cones and flood-prone areas of offshore islands, including, at a minimum, that area subject to a 1 percent (100-year recurrence) or greater chance of flooding in any given area.

Fragmentation
Process by which a landscape matrix (dominant patch type, such as natural forest) is divided into smaller disconnected patches by some process, often human activity.

Forbs
Any herbaceous plant, other than a grass, that dies back every year. Often grows in a field or meadow.

Group Selection
Removal of trees in groups smaller than 2 acres in size. It is an *uneven* age management system, where clearcutting in an *even* age management system.

Habitat Capability
The number of healthy birds or mammals that a habitat can sustain. In this document it refers to Sitka black-tailed deer, marten, black bear, river otter, and bald eagle capability.

Habitat Suitability Index
A computer model index that quantifies the capability of habitat to support particular species of wildlife.

Helicopter Yarding
A process of removing logs from the harvest unit where the helicopter picks up the logs right where they are cut and moves them to a central location on a road or landing to be hauled away by truck or moved by helicopter directly to the water for transport.

High Lead Cable Logging
A method of transporting logs to a collecting point by using a power cable passing through a block fastened off the ground to lift the front ends of the logs clear off the ground while in transit.

High Value Wildlife Habitat
Having a combined habitat suitability index of .7 or greater, and/or has been determined through field reconnaissance to have significant value for use as cover forage or security.

Inoperable Timber
Timber which is not practical to harvest because of potential resource damages, lack of economic feasibilty, physical limitations, or inaccessiblility.

Interdisciplinary Team (IDT)
A group of individuals representing different areas of knowledge and skills focusing on the same task, problem, or subject.

Irretrievable Commitment
The production or use of renewable resources that is lost because of allocation decisions. It represents opportunities foregone for the period of time that the resource cannot be used.

Irreversible Commitment
Commitment of resources that are renewable only over a long period of time, such as soil productivity, or to nonrenewable resources, such as cultural resources or minerals.

Land Use Designation (LUD)
The method of classifying land use by the Tongass Land Management Plan. Land uses and activities are grouped together with a set of coordinating policies, an essentially compatible combination of management activities. A brief description of the four classifications follows:

LUD I: Wilderness areas.

LUD II: These lands are to be managed in a roadless state to retain their wildland character, but this designation would permit wildlife and fish habitat improvement, utility corridors, and primitive recreation facility development and roads under special authorization.

LUD III: These lands are to be managed for a variety of uses. The emphasis is on managing for uses and activities in a compatible and complimentary manner to provide the greatest combination of benefits.

LUD IV: These lands will provide opportunities for intensive resource use and development. Emphasis is primarily on commodity or market resources.

Log Transfer Facility (LTF)
A facility located where the road network terminates at saltwater. May be used for a number of transportation purposes. For timber harvesting, the log transfer facility is where logs are bundled and placed into rafts on the water for towing to local mills.

Managed Stands
Contiguous group of trees, uniform in species composition and arrangement of age classes, which has been modified to meet management objectives.

Mass Failures or Mass Movement (wasting)
The downslope movement of a block or mass of soil. This usually occurs under conditions of high soil moisture, and does not include individual soil particles displaced as surface erosion.

MBF and MMBF
Thousand board feet and million board feet, respectively.

Mid-Market
Mid-market timber is timber which, in a mid-market assessment, would provide a weighted average margin for profit and risk of at least 60% of normal. The mid-market assessment to mid-market timber shall be based on mid-market weighted average pond log value, estimated logging and road costs, normal profit ratios, and base

rates developed using standard Forest Service appraisal methods and data in effect on the date the Forest Service initiates the NEPA process (Notice of Intent is published in the Federal Register).

Pond Log Value--Mid-market average pond log value shall be determined as follows: 1) Appraisal data to develop a mid-market pond log value shall be determined for each species, and shall be the standard Forest Service appraisal data in effect in the quarter in which the pond log value (end-product selling price less manufacturing cost) for the species and product mix most closely matches the point between the ranked quarters of the Alaska Index Operations pond log value, adjusted to Common Year Dollars, where one-half of the timber from the Tongass National Forest has been removed at higher values and one-half of the timber from the Tongass National Forest has been removed at lower values during the period from the first quarter of 1979 to the quarter current on the NEPA start date. When more than one quarter would qualify, the most recent shall be used. 2) Mid-market weighted average pond log value shall be calculated by volume class, adjusted to Common Year Dollars, using appraisal data determined for each species.

Common Year Dollars-- dollars adjusted to the NEPA start date, using the relevant indicies in the Producer Price Index for all commodities published by the USDL Bureau of Labor Statisics.

Mining
Includes all operations (prospecting, exploration, development) for the extraction of mineral resources--underground, placer, and open pit mines; rock, and sand and gravel borrow, etc.

Mitigation
Action or actions taken to avoid or minimize negative impacts of a management activity. Includes avoiding an impact altogether by not taking a certain action or part of an action; minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

Monitoring
Following a course of events to determine what changes occur as the result of an action.

NEPA
National Environmental Policy Act of 1969.

New Perspective
New Perspective is the pathway for implementing certain of the new directions in the 1990 RPA Program (the Forest Service's 5-year strategic program for carrying out its mission under federal laws and regulations) and new Forest and Research plans. These plans and programs call for their full array of values and benefits, with increased emphasis on fisheries, wildlife, recreation, ecological sustainability, and long-term productivity. The two main goals of New Perspectives are 1) to demonstrate the new directions for socially responsive and scientifically sound management of lands and resources to meet people's needs for forest and rangeland products while protecting natural and cultural resources for long-term health of the land and quality of life, 2) to develop the new scientific knowledge and technologies needed to better manage forest and rangeland ecosystems.

NFMA
National Forest Management Act of 1976.

Non-Commercial Forest Lands
Lands with more than 10 percent cover of commercial tree species but not qualifying as Commercial Forest Land.

Primary Protection
Primary Protection of Primary Streamcourses is a timber sale contract provision requiring the protection of designated "Primary" streams. This involves developing an Operating Plan (including timing and guyline circle trees) for falling timber within a 200-foot streamside strip, directional felling away from streamcourses, immediate yarding of any trees entering streamcourses, leaving designated felled or windthrown trees that have entered streamcourses, and full suspension yarding across such streamcourses. "Primary" streamcourses are usually fish streams or other streams requiring a high degree of water quality protection.

Profit & Risk
That portion of the appraisal allocated to industry profit, interest on borrowed capital, risk, and income taxes.

Profit & Risk Margin
The monetary estimate of Profit & Risk

Recreation Opportunity
The availability of real choice for recreationists to participate in a preferred activity within a preferred setting, in order to realize those satisfying recreation experiences which are desired. Recreation opportunities are often described in terms of seven classes of opportunity:

Primitive: The most remote, undeveloped, and inaccessible opportunities. Generally includes areas out of sight and sound of human activities and greater than three miles from roads or waterways open to public travel.

Semi-Primitive, Non-Motorized: A natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed to minimize onsite controls and restrictions. Use of local roads for recreational purposes is not allowed.

Semi-Primitive, Motorized: Predominantly unmodified natural environment with minimum evidence of sights and sounds of humans with primitive roads and trails open to motorized use. Generally includes areas less than 1/2 mile from waterways. Roads are not maintained.

Roaded, Natural: Predominantly natural environments with moderate evidence of sights and sounds of humans. Includes areas less than 1/2 mile from roads open to public travel, railroads, waterways, major powerlines and within resource modification areas.

Roaded, Modified: Modifications in vegetation and landform dominate the landscape with minimum evidence of sights and sounds of humans. Compared to the Roaded Natural setting, the Roaded Modified setting allows greater alteration to the natural environment and less evidence of humans.

Rural: Includes those areas within small communities, developed campgrounds, developed ski areas, and administrative sites. Modifications are primarily to enhance specific recreation activities. Sights and sounds of humans are readily evident.

Modern-Urban: Substantially urbanized environments, although the background may have elements of a natural environment. Renewable resource modifications and utilization practices are common. Vegetative cover is often exotic and manicured. Sights and sounds of humans are predominant.

Recreation river
Those rivers or sections of rivers that are readily accessible by road or railroad, that may hav development along their shorelines, and that may ahve undergone some impoundment or diversion in the past (16 U.S.C. 1273).

Resident Fish
Fish which are not anadromous and which reside in fresh water on a permanent basis. Resident fish include non-anadromous Dolly Varden char and cutthroat and rainbow trout.

Riparian Ecosystems
Includes wetlands, streams and lakes, and those areas around streams and lakes which can influence the aquatic environment.

Road Maintenance Level 1
Roads closed after use, maintain drainage systems (pipes, ditches, and culverts).

Road Maintenance Level 2
Roads maintained for high clearance vehicles only, remove cut bank slumps and slides only when necessary to provide for continued use (may be one lane only).

Road Maintenance Level 3
Maintained for passenger use; user comfort is an important aspect. Subject to Highway Safety Act as far as signing and traffic control requirements.

Rock Weathering Agent
A compound that is sprayed on rocks to speed natural weathering by accelerating the oxidation process. Harmless to plants and wildlife, it is used to make disturbed land blend in with the natural landscape.

Rotation
The planned number of years between the formation of regeneration of a stand and its final cutting at a specified stage of maturity.

Scenic river
Those rivers or sections of rivers that are free of impoundments with shorelines or watersheds still largely undeveloped, but accessible in places by roads.

Secondary Protection
Secondary Protection or Protection of Secondary Streamcourses is a timber sale contract provision requiring the protection of designated "secondary" streams. This involves removing timber felled across such streams within the same operating season, and removing logging slash from the streamcourse before the yarder leaves the harvest unit or upon completion of seasonal logging activities, whichever comes first.

"Secondary" streamcourses are those which do not possess fish habitat but could affect habitat downstream.

Sedimentation
Addition of fine organic or inorganic material to a stream channel. Usually that portion remaining in the streambed gravel.

Sensitivity Levels
A measure of viewer interest in scenic quality of the landscape as seen from roads, trails, waterways or other travel routes and from facilities or other areas of the national forest that have significant public use. Level 1 has the highest sensitivity, level 3, the lowest.

Setting
The setting identifies the timber stands that are tributary to a landing by use of a given timber harvest system.

Shear Strength
Ability to resist shear stress, which is the force of two planes pushing against one another and producing parallel but opposite sliding, like a fault line.

SHPO
State Historic Preservation Officer

Skyline
A cableway stretched tautly between two points and used as a track for a block or carriage.

Soil Hazard Classes
Mass-wasting as used here is restricted to relatively shallow translational failures of the soil mass, and specifically excludes deep rotational failures and debris failures within stream channels. While slope gradient is the primary site factor determining the stability of natural slopes, soil and geologic properties, such as cohesion, moisture regime and the presence of a prominent slip-plane are used to determine relative stability of soil/landtype units. The relative ranking is based on state-of-the-art research, laboratory data on soil properties, as well as our collective experience in the management of similar soil/landtype areas on the Tongass N.F.

> ***High***: The soil/landtype units in this class are the least stable, and have the greatest probability of slope failure. These units generally have slope gradients that exceed the natural angle of stabilty. It includes most well-drained soils on slopes of 75 percent or greater, as well as some soils with restricted drainage (somewhat poorly and poorly drained soils) on slopes in excess of 65 percent. Most naturally occurring landslides initate in units of this class. They often, but not always, have visible indications of instability or past failures, such as slide scarps, tension cracks, jack-strawed trees, mixed pedogenic horizons, and others.
>
> The risk of management-induced slope failures is so high on these areas that they are generally precluded from normal forest harvest and roading activities. Where management activies cannot be avoided on these areas, site specific investigations are necessary to determine the following on a case-by-case basis: (1) the probability of failure based on a site-specific stability analysis; and (2) the likely effect of a failure on associated resources such as water quality, fish habitat, etc. Forest roads can sometimes be built on these areas by locating them on included areas of less sloping benches, or by the application of unusual,

and often prohibitively expensive, mitigative measures such as retaining walls, buttresses, bulkheads or other external support systems.

Moderate: The soil/landtype units in this class are generally stable in an undisturbed condition; however, any natural disturbance or management practice that adversely changes the complex soil strength-stress relationship can result in slope failures. These areas rarely have visible indications of instability.

Soil/landtypes in this class can be safely managed without a high risk of landslides by application of management practices designed to maintain the shear strength of soil and roots, and avoid increasing the effective weight of the soil mass. Management practices should be designed to avoid interrupting the natural surface and subsurface drainage patterns and minimize disturbance to the soil surface.

Low: Soil/landtype units in this class have the least probability of landslides. Any slope failures that do occur are usually associated with included incised stream channels (V-notches), or short steep escarpments. This class includes most soils with slope gradients less than 35 percent.

These areas are normally not subject to landslides; however, management practices designed to protect streambanks and V-notches and prevent surface erosion are appropriate.

Splitline
Use of a topographic feature as a harvest setting boundary

Swale
A slight depression, sometimes swampy, in the midst of generally level land.

Temperature-Sensitive Stream
Those streams flowing out of lakes or muskegs, or for some other reason susceptible to warming beyond a tolerable level for fish.

Threshold of Concern
The relative level of sensitivity of a watershed. Tree harvest near or over the threshold indicates increased risk of water quality degradation. Factors considered when determining this include drainage densities, average stabilities of various channel types, erodibility of the various soils encountered, and an index of beneficial use values.

Track Loader
A short yarding distance, high-lead system.

Unit
A term from the Timber Sale Contract. This term is used to describe the smallest identifiable portion of land included in a timber sale for timber harvest. Each unit consists of one or more settings and associated landings. All the settings included in a unit are planned for timber harvest using the same yarding method and are in proximity to each other.

VCU - Value Comparison Unit
A distinct geographic area that generally encompasses a drainage basin containing one or more large stream systems. Boundaries usually follow easily recognizable watershed divides. These units were established to provide a common set of areas for which resource inventories could be conducted and resource value interpretations made.

V-notch
A typically high gradient (> or = to 6%) that is sharply incised into the surrounding landform.

Visual Absorption Capability (VAC)
A measure of the relative ability of the landscape (high, intermediate or low) to absorb visual change. Ratings are based on landform complexity, slope, viewer aspect/angle and vegetative screening. High VAC is characterized by low rolling topography or unseen slopes where management activities are not likely to be seen. Low VAC is characterized by steep, highly visible hillsides with a uniform cover of vegetation.

Visual Management Classes (VMC's)
A product of the combination of VQO's and VAC's, Visual Management Classes indicate the management objective and the relative effort required to meet that objective. VMC's 1 and 2 indicate areas of high scenic value or landscapes with steep, highly visible slopes. Special attention to project design would be necessary to meet VQO's. VMC's 3 and 4 indicate areas that are generally not seen or that have low, rolling topography, and VQO's would be relatively easy to meet.

Visual Quality Objectives (VQO's)
VQOs are standards for visual quality which reflect the varying degrees to which the landscape may be modified. The standards are based upon viewing distance, the character of the natural landscape, and the public's concern for scenic quality. "Inventory" VQO's have not yet undergone trade-off analysis relative to other resources. "Adopted" VQO's reflect analysis involving other resources and become management direction in a selected and approved land management alternative, usually as part of a forest land management plan. The five visual quality management objectives follow:

Preservation (P)--Only ecological changes occur. Management activities, except for very low visual impact recreation facilities, are not prescribed.

Retention (R)--Provides for management activities which are not visually evident. Visual effects of management activities on the natural landscape are evident to the average viewer.

Partial Retention (PR)--Management activities may be evident to the viewer, but must remain visually subordinate to the surrounding landscapes.

Modification (M)- Management activities may be easily noticed and attract attention, but borrow from naturally established form, line, color, and texture to create natural patterns.

Maximum Modification (MM)-- Land management activities may be strongly evident and dominate the natural landscape, but appear as a natural occurrence when viewed as background.

Wetlands
Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wild river
Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, eith watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Winter Range
Areas used by animals from December through March, when many sources of food are covered with snow. For deer, winter range is generally found below 1,200 feet elevation on north-facing slopes and below 1,500 feet elevation on all other slopes. During severe winters, the greatest number of deer can be supported by high-volume, old-growth stands on south-facing slopes, below 500 feet elevation and within 1/4 mile of salt water.

Index

Index

Bibliography

Bibliography

ADF&G Subsistence Division, "Southeast Alaska Subregional Summaries and Community Profiles. A Report to the Joint Boards of Fisheries and Game." Juneau, Alaska, 1987.

Alaska Native Claims Settlement Act, December 18, 1971, Public Law 92-203, 85 Stat. 688; US Code 1982 Title 43, Sections 810. Section 1100.

Analysis of the Management Situation. Tongass National Forest Land and Resource Management Plan Revision. Appendix 1. 1989.

Arndt, K.L., R.H. Sackett and J.A. Ketz, A Cultural Overview of the Tongass National Forest, Alaska (Part 1: Overview). Unpublished study on file at USDA Forest Service, Tongass National Forest, Stikine Area Supervisor's Office, Petersburg, Alaska, 1987.

Cohen, Kathryn A., Wrangell Harvest Study; a comprehensive study of wild resource harvest and use by Wrangell residents. Technical paper No. 165 prepared under contract by Phoenix Associates for the Alaska Dept. of Fish and Game, Subsistence Division, Juneau, Alaska, 1989.

CFR 219:19 Code of Federal Regulations 36 CFR 219:19, Planning (viable wildlife populations).

Edgington, John, Brian Lynch. Stream Habitat Inventory: Kadake Bay, Port Camden, Eastern Rocky Pass, Totem Bau and Upper Duncan Canal, Volume II. State of Alaska. March 1982.

Erickson, A.W.,Hanson, B.M., Brueggeman, J.J. "Black Bear Denning Study, Mitkof Is., Alaska." University of Washington. Seattle, Washington. 1982.

Federal Interagency Committee for Wetland Delineation, 1989. *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S.D.A. Soil Conservation Service. Washington, D.C. Cooperative technical publications.

Flynn, Rod. Research Wildlife Biologist, Alaska Department of Fish and Game. Interview with Bob Daniels, Spring 1991.

Firman, Ann S. and Robert G. Bosworth, "Harvest and Use of Fish and Wildlife by Residents of Kake," Technical Paper No. 145. Juneau, Alaska, 1990.

Goldschmidt, Walter R. and Theodore H. Haas. Possessary Rights of the Natives of S.E. Alaska. A Report to the Commissioner of Indian Affairs. Mimeograph. Washington, D.C. October 1946.

Hutchison, O. Keith, Vernon J. LaBau, "The Ecosystem of Southeast Alaska," Vol. 9 Timber Inventory, Harvesting, Marketing and Trends, USDA Forest Service General Technical Report PNW-34 1975.

Kruse, Jack and Rosyland Fraisen. "Report the Communities: Tongass Resource Use Cooperative Survey." University of Alaska - Institute for Social and Economic Research. Anchorage, Alaska. 1988.

9 Bibliography

Larsen, Douglas N., "Habitats, Movements, and Foods of River Otter in Coastal Southeastern Alaska." MS Thesis, University of Alaska, 1983.

McCorison, F. Michael, Gail Johnejack, Everett Kissinger. A Method to Analyze Watershed Sensitivity. *Proceedings, Watershed '89, A Conference on the Stewardship of Soil, Air, and Water Resources*. USDA Forest Service. Alaska Region, R10-MB-77, 1989.

Merriam, H.E., Deer Fluctuations in Alaska. Paper presented at the 1970 Annual Meeting, Northwest Section Wildlife Society. Spokane, Wa.

1991-1996 Recreation Plan. Stikine Area, Petersburg Ranger District, Tongass National Forest. USDA.

Pavitt, R.W. & Associates. *Kake Coastal Management Plan*. 1984.

Pawuk, H. William, Everett J. Kissinger. "Preliminary Forest Plant Associations of the Stikine Area." Tongass National Forest, Stikine Area, USDA Forest Service R10-TP-72. 1988.

ROS Users Guide. Forest Service. USDA. 1982

Rabich-Campbell, C. Raven's Wrinkled Foot: Cultural Resources Overview of Kupreanof Island, Southeast Alaska. Unpublished study on file at the USDA Forest Service, Tongass National Forest, Stikine Area Supervisor's Office, Petersburg, Alaska. 1988.

Smythe, Charles W. "Harvest and Use of Fish and Wildlife Resources by Residents of Petersburg, Alaska." Technical paper No. 164. Prepared by Chilkat Institute for the Alaska Dept. of Fish and Game - Subsistence Division, Juneau, Alaska. 1988.

Southeast Alaska Area Guide. USDA Forest Service. 1977.

Spencer, W.D., "Seasonal Rest-site Preferences of Pine Martens in the Northern Sierra Nevada." *Journal of Wildlife Management Volume 51*: 616-621, 1987.

Swanston, D.N. A Preliminary Analysis of Landslide Response to Timber Management in Southeast Alaska: An Extended Abstract, in *Proceedings, Watershed '89, A Conference on the Stewardship of Soil, Air, and Water Resource*. 1989.

Swanston, John R., Social Condition, Beliefs, and Linguistic Relationship of the Tlingit Indians. Bureau of American Ethnology, Washington D.C. 1904.

Taylor, R.F. *Yield of Second-Growth Western Hemlock-Sitka Spruce Stands in Southeastern Alaska*. U.S.D.A. Technical Bulletin No. 412. March 1934.

Tongass Resource Use Cooperative Survey, Mapped Data, Cooperative project by University of Alaska - Institute for Social and Economic Research, Alaska Department of Fish and Game - Subsistence Division, and USDA Forest Service - Alaska Region. Anchorage, Alaska. 1988.

Tongass Land Management Plan, Final Environmental Impact Statement. USDA Forest Service. 1979.

Tongass Land Management Plan, Amended Winter 85-86. USDA Forest Service, 1985-86.

Tongass Land Management Plan Revision DEIS 1990 - Draft Environmental Impact Statement. 1990. USDA Forest Service.

USDA-FS, 1986, R-10 *Aquatic Habitat Management Handbook, FSH 2609.24*. U.S. Department of Agriculture-Forest Service. Alaska Region. Juneau, Alaska.

USDA-FS, R-10 *Soil and Water Conservation Handbook, FSH 2509.22*. U.S. Department of Agriculture, Forest Service. Alaska Region. Juneau, Alaska. 1990.

USDA-FS, R-10 *Channel Types Field Guide, Draft*, R10-MB-6. U.S.Department of Agriculture, Forest Service. Alaska Region. 1987. Updated 1991.

Van Ballenberghe, V. and T.A. Hanley, "Predation on Deer in Relation to Old-growth Forest Management in Southeastern Alaska, Fish and Wildlife Relationships in Old-growth Forests: Proceedings of a symposium." 1984.

Worthernm G.L, and D.L. Kilgore, Jr., "Metabolic Rate of Pine Martens in Relation to Air Temperature." *Journal of Mammalogy* 62:624-630.

Appendix A

APPENDIX A

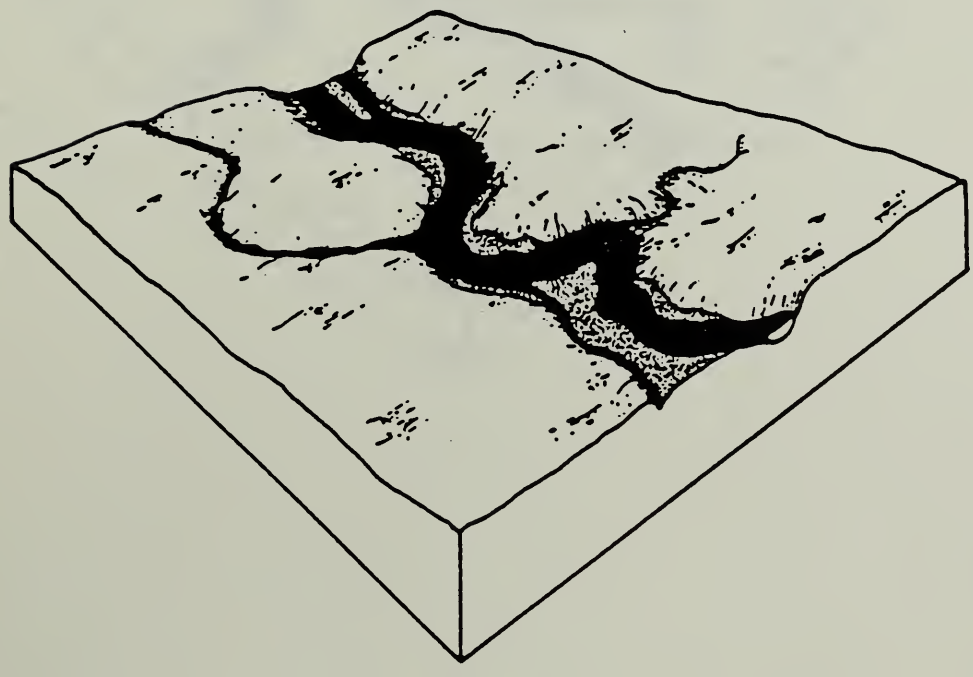
STREAM CHANNEL PROCESS GROUPS

The term "process group" refers to a group of stream channels that were all formed by the same geologic processes. This appendix describes nine different process groups, lists the stream channel types in each group, and explains some of the management implications of each group.

Floodplain Stream Channels

These are channels (designated as B1, C1, C3, C4, and C6 channel types in the process group delineation in Draft F of the Tongass Land Management Plan Revision) with active floodplain development. Floodplain channels have a two-way interaction (that is, first, water flows out as flood, with materials deposited and second, detritis, etc. falls in and provides nutrients) between the stream channel and the floodplain area through bank erosion, channel migration and overflow, leaf fall, and blowdown/tree fall. Alluvial channels process energy for the stream and are an important source of nutrients. Flooding is a fundamental process in alluvial channels. The riparian zone is usually very broad and adjacent upland plants do not directly influence the riparian areas.

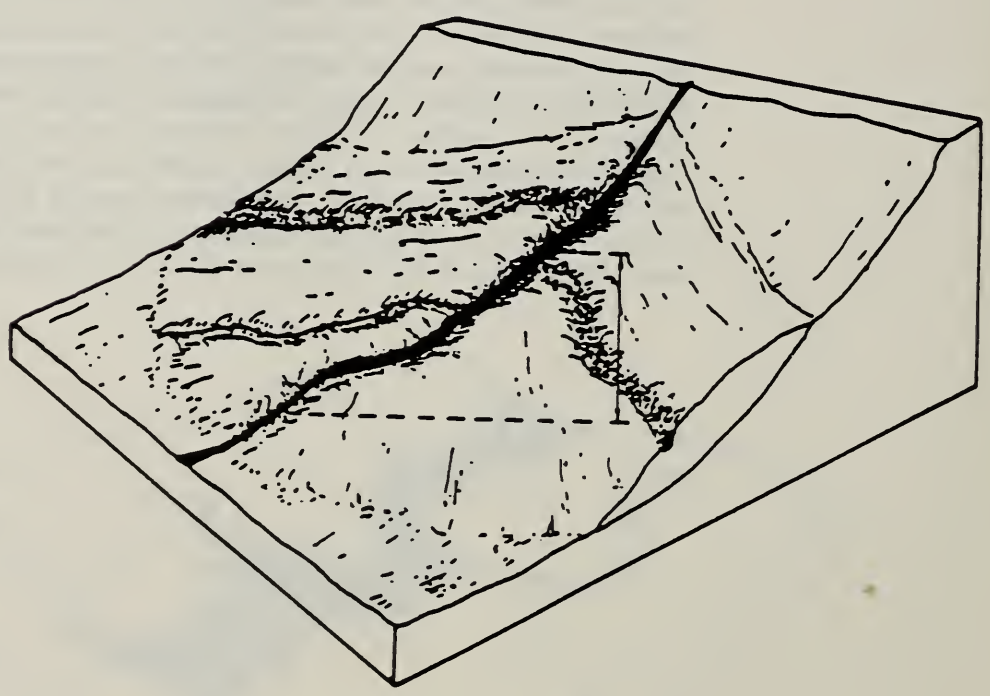
The riparian areas are extremely dynamic because streamflows within alluvial or uncontained areas are generally poorly contained and flood during seasonal or individual storms. Stream channel banks consist of unconsolidated materials, either alluvial sands, gravels or organic material. Channel migration and braiding of the stream channels occurs with varying frequency, depending on bank and bed stability. The bed and bank stability are usually tied to the adjacent plants. Trees and shrubs are very important to controlling the stability of the streambanks, as their root network often is the only thing holding together the unconsolidated alluvial streambank soil. Large Organic Debris (LOD) plays an important role in controlling the stability of the stream bed and banks by regulating the stream's energy dissipation. Habitat forms in the pool riffles caused by the energy dissipation. The riparian area adjacent to the alluvial channels encompasses the channel banks, active channel floodplain, sloughs, backwater overflow channels, and ponded swales. Because of the interactions of the stream with the adjacent landform, the alluvial channels contain a richer, more abundant community of fish than found in contained stream channels.



Channels on the Alluvial Fans

These channels (designated as A3 and B5 in the process group delineation in Draft F of the Tongass Land Management Plan Revision) are transitional, being streams that are dominated by both sediment transport and sediment deposition. High energy streamflows of low to moderate magnitude are delivered to fans from their contained drainage basins located upstream. Flood flows which occur episodically are a result of flash floods or debris torrents delivering high volumes of sediment which are quickly deposited on the streambed, streambanks, and areas adjacent to the stream. Stream channel migration or abandonment often occurs during these events. The stream channels are numerous and are generally found throughout the fan area. Many of the channels are ephemeral, flowing only after certain levels of precipitation.

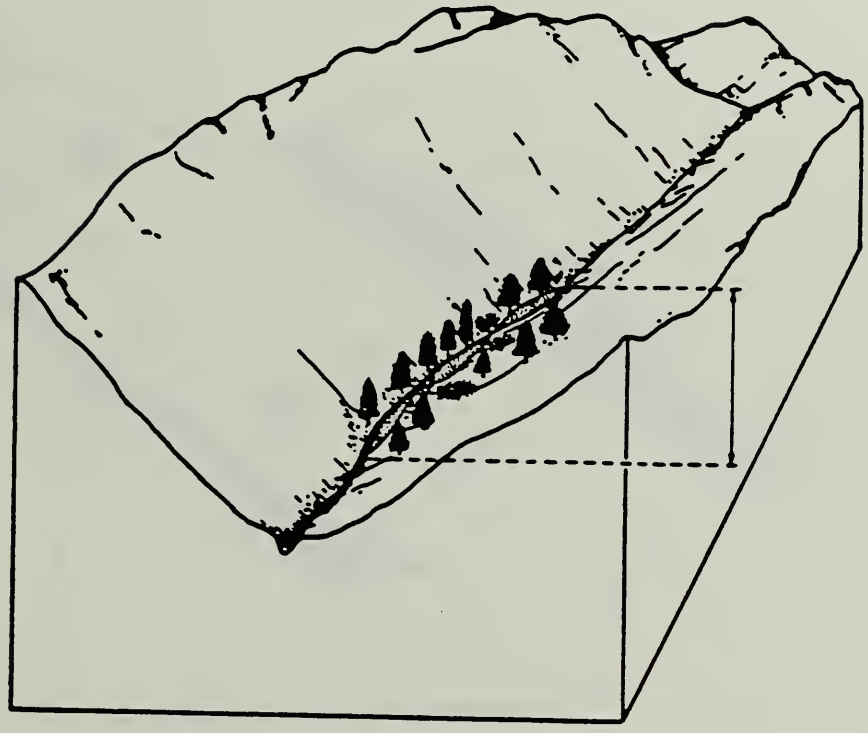
The rearing and spawning habitat value of fan channel types for salmon and trout varies from high to low. The channels are unstable, and sometimes intermittent during low streamflow periods in the summer and winter months, thereby limiting their use for rearing coho salmon and resident trout. The gravel beds are unstable due to the high energy flows and the large amounts of coarse gravels moving through the fan channels, so successful spawning is limited. However, on the toe end, or lower gradient portions of the fans, the value is higher for spawning and rearing for coho and pink salmon. Where abundant large organic debris is present, the value for coho salmon can be moderate to high. The toe ends are also characterized by more stable gravel beds, thereby increasing spawning value.



Channels with "Mixed" or Colluvial Control

As the name implies, these channels (designated as B2 and B3 channels in the process group delineation in Draft F of the Tongass Land Management Plan revision) are a mixture of stream channel containment. Some segments are controlled by bedrock or the valley walls, while other areas have minor floodplains. Within these moderate gradient channel types, the bedrock segments of the channel act as sediment transport systems, while bed materials are deposited in the lower gradient, and floodplain development is apparent.

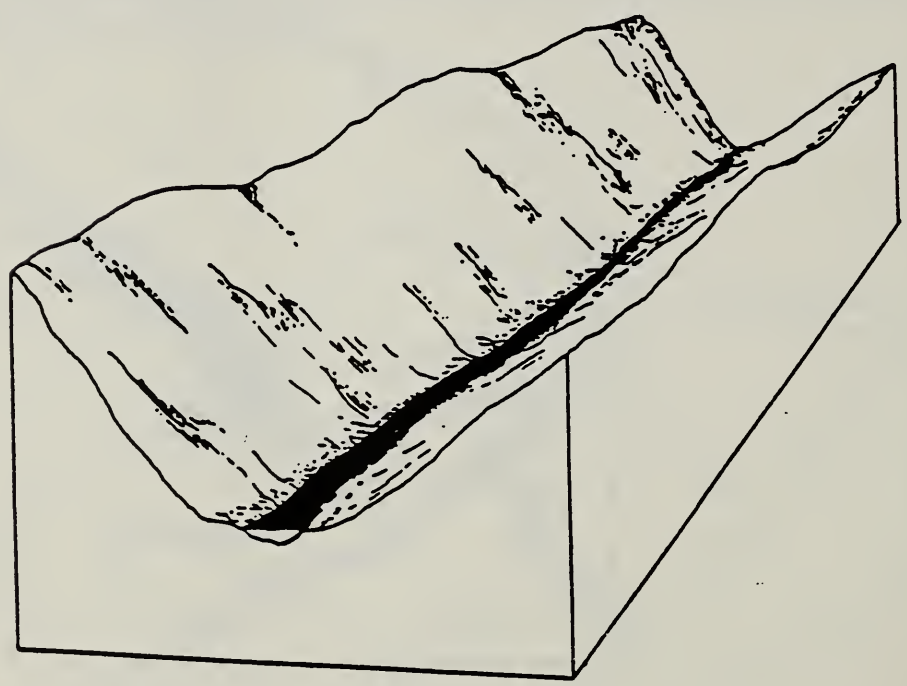
The habitat capability and sensitivity of these channels to disturbances caused by management is midway between floodplain and contained channels. The importance of the interaction between the stream channel and riparian vegetation is intermediate. Much of the better rearing habitat, particularly the coho salmon winter refuge habitat, is associated with large organic debris accumulations in the stream. Within "mixed" channel types microhabitats that provide winter refuge may be even more important than in the alluvial streams.



Low Gradient Contained Channels

These are streams (designated as C2, C5 channel types in the process group delineation in Draft F of the Tongass Land Management Plan Revision) where the channel is contained by the adjacent landform with the channel having little effect on that landform. The adjacent influence zone often extends to the slope break above the incised valley slope. The width of the zone of influence on the aquatic habitat is dependent upon the adjacent upland soils and vegetation (primarily trees). The adjacent vegetation plays a major role in controlling the rate of downslope movement of soil into the stream channels, as well as providing energy dissipation structures in the stream channels to trap and store sediment that is being transported downstream.

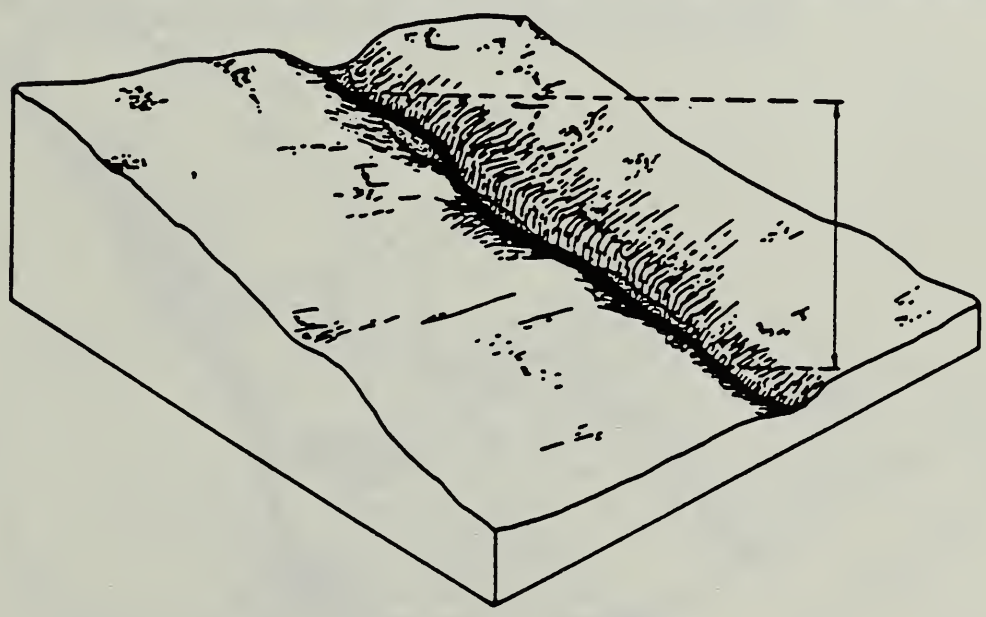
The lower gradient channels contain habitat for large numbers of spawning pink salmon, particularly in the lower segments where large accumulations of suitable-sized spawning substrates exist. Rearing habitat, particularly winter refuge habitat, is limited to sections of the stream where large quantities of large organic debris have accumulated in the stream.



Moderate Gradient Contained Channels

These channels (designated as B4 and B6 channel types in the process group delineation in Draft F of the Tongass Land Management Plan revision) are also contained by the adjacent landform, with moderate instream gradients. Stream energy, substrates, and run-off are effectively contained by landform or streambank features. When the adjacent sideslopes are short, low gradient or absent, the influence zone is narrow. This group can have streams with very large, high gradient sideslopes which correspond to large areas that influence stream conditions. These streams are very much influenced by the highly sensitive natures of these sideslopes.

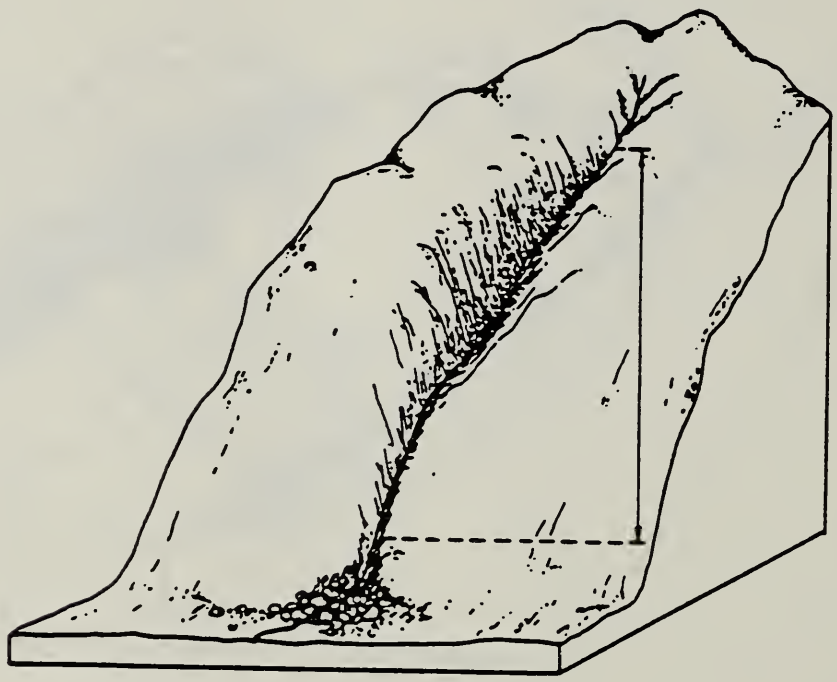
The moderate gradient channels contain limited amounts of anadromous fish habitat. When access is available, spawning habitat is limited due to lack of suitable-sized substrates. Rearing habitat is limited to summer habitat for coho and steelhead trout. Moderate gradient-contained channels usually provide moderate resident fish rearing potential.



High Gradient Contained Channels

These channels (designated as A1, A2, A4, A5, A6, A7 and B7 channel types in the process group delineation in Draft F of the Tongass Land Management Plan revision) are source streams for downstream waters and transport organic and inorganic sediments to the downstream habitats. The stream channels are well contained within the narrow valley bottoms. Channel banks are steep and generally composed of large material, either consolidated bedrock or well packed boulders, rubble, and cobbles. The channels are predominantly influenced by the upland or terrestrial plant communities. Soils in the adjacent upland area are often shallow and subject to downslope movement. Leaves, forest litter, and trees often move downslope into these incised channels when disturbance occurs.

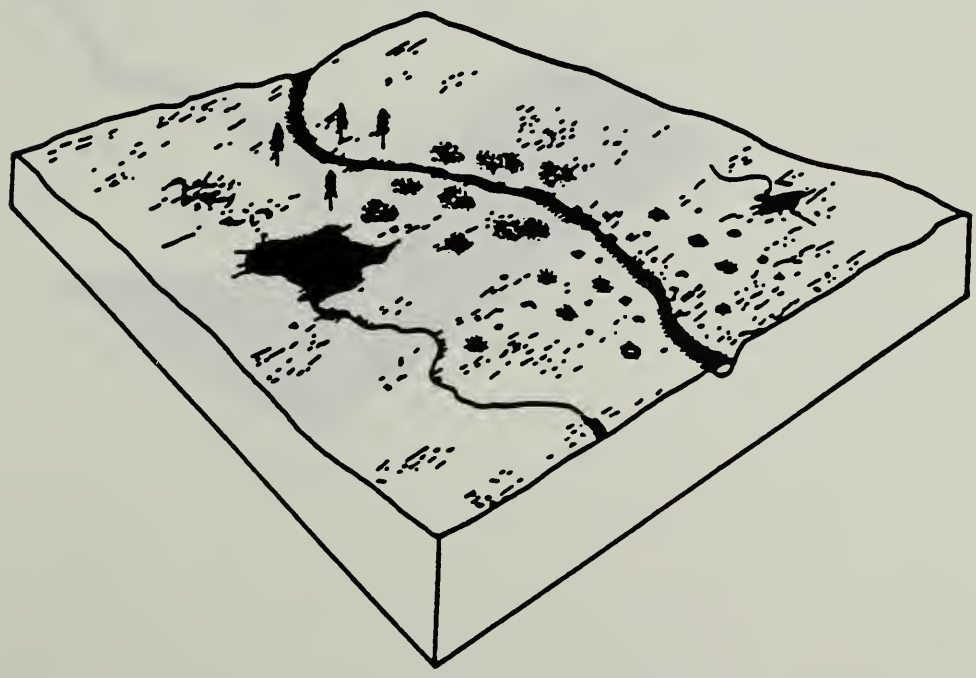
High gradient contained streams generally do not produce anadromous fish, as numerous waterfalls and cascades prevent access. The lack of high quality rearing pools limits the production of resident fish.



Glide Streams

These channels (designated as L1 and L2 in the process group delineation in Draft F of the Tongass Land Management Plan Revision) occur throughout the watershed on gently sloping lowland landforms and are frequently associated with bogs and marshes, or lakes. Because of the low gradient, most of the sediment being transported in the stream channels is sand-sized or smaller, and much of it settles out in the gently gradient channels. Though the channels are shallowly incised and have fair flow containment, flood flows usually overtop the streambanks and flow onto the adjacent landform, lessening downstream flooding and serving as a buffer during major storms. Low gradient, slow flowing streams are often associated with temperature sensitive watersheds. The lower banks are composed of material that erodes easily. Productivity of the channel is moderately tied to the riparian/terrestrial interaction. The bank trees control the channel stability in the floodplain control areas.

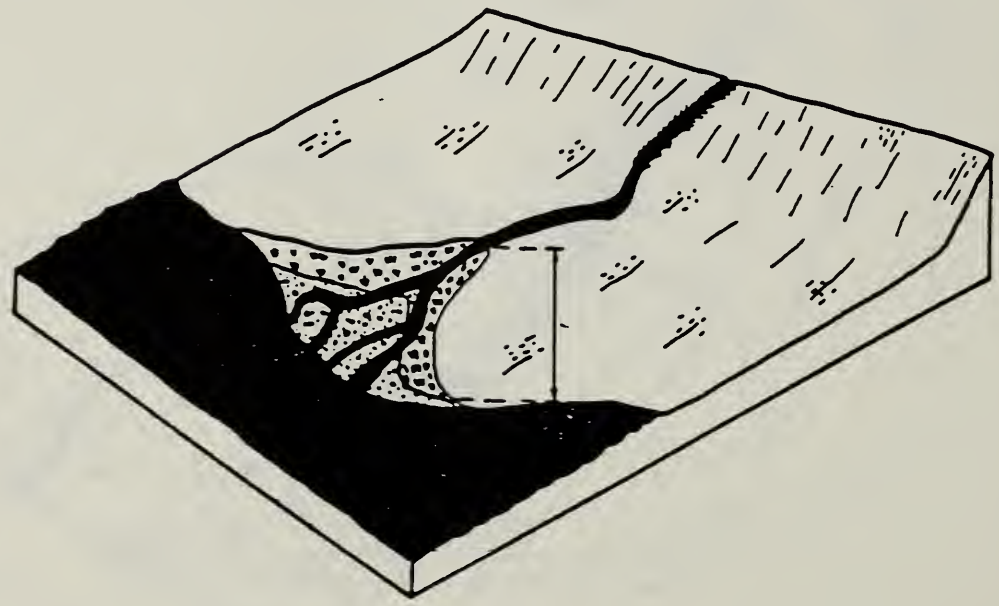
Glide streams have moderate to high capability for coho salmon. Spawning gravels are not abundant, but are usually sufficient to fully seed the available habitat. The channels provide summer coho rearing habitat, but usually more limited "overwinter" habitat, due to the lack of abundant large complex pools that provide quality winter refuge. C7 channels that form the outlet channels of lakes do provide good overwinter habitat due to the temperature moderation of the upstream lake waters. The better rearing habitat, particularly winter refuge habitat, is tied in order to undercut banks, and large organic debris controls the long term maintenance of much of the rearing and spawning habitat. The channels are frequently used by pink salmon for spawning.



Estuarine Stream Channels

These channels (designated as E1, E2, E3 and E5 channels in the process group delineation in Draft F of the Tongass Land Management Plan Revision) occur at the mouths of watersheds within estuarine landforms. The single to multiple channels are shallowly incised with fair to poor flow containment and are characterized by small alluvial material. The various channel types within the estuarine group are differentiated by channel substrate size. Sediments produced from the watershed are ultimately deposited in the estuarine channels. Consequently, they are highly sensitive to upstream management activities.

The streambanks and channel beds are composed of loose, fine-textured material which are easily eroded. As a result, bank widths and depths are highly variable and bank and channel beds are unstable. Sedge and marshland plants dominate the streamside and the interaction between the upland plants and the stream environment is minor. Stream migration and braiding varies, depending largely on bank and bed stability. The bed stability is critical for the production of pink salmon fry from the estuarine areas, where the streams are excellent producers of pink salmon. These channels provide important rearing habitat for most species.



Lakes and Ponds

These types (designated as L, L3, L4 and L5 channels in the process group delineation in Draft F of the Tongass Land Management Plan Revision) consist of lakes and ponds (including most beaver ponds). Lakes contain valuable aquatic habitat for some fish species, primarily sockeye and coho salmon, and trout.

Appendix B

APPENDIX B

SOIL HAZARD CLASSES

The planning level stability analysis of the study area is based on the Soil Resources Inventory of Kupreanof Island. Landscape hazard classes are used to group soil map units that have similar properties regarding the stability of natural slopes. Three classes; high, moderate, and low, rank soil units according to their relative potential for sliding. *Sliding* as used here is restricted to relatively shallow translational failures of the soil mass, and specifically excludes deep rotational failures and debris failures within stream channels. While slope gradient is the primary site factor determining the stability of natural slopes, soil and geologic properties, such as landform, soil and tree root cohesion, soil moisture regime, and the presence of a prominent slip-plane are used to determine relative stability of natural soil/landtype units. The relative ranking is based on the soil resource inventory, state-of-the-art research, and laboratory data on soil properties, as well as our collective experience in the management of similar soil/landtype areas on the Tongass National Forest.

HIGH

The soil/landtype units in this class are the least stable, and have the greatest probability of slope failure. These units generally have slope gradients that exceed the natural angle of stabilty. It includes most well-drained soils on slopes of 75 percent or greater, as well as some soils with restricted drainage (somewhat poorly and poorly drained soils) on slopes in excess of 65 percent. Most natural occurring landslides start in units of this class. These areas often, but not always, have visible indications of instabilty or past failures.

The risk of management induced slope failures is so high on these areas that they are generally precluded from normal timber harvest and roading activities. Where management activies cannot be avoided on these areas, site specific investigations are necessary to determine on a case-by-case basis; (1) the probability of failure based on a site-specific stability analysis; and (2) the likely effect of a failure on associated resources such as water quality, fish habitat, etc. Forest roads can sometimes be built on these areas by locating them on included areas of lesser slopes such as a small bedrock bench, or by the application of unusual, and often prohibitively expensive, mitigative measures such as retaining walls, buttresses, bulkheads or other external support systems.

MODERATE

The soil/landtype units in this class are generally stable in an undisturbed condition, however, any natural disturbance or management practice that adversely changes the complex soil strength-stress relationship can result in slope failures. This class generally includes most well-drained soils on slopes ranging from 35 to 75 percent as well as some somewhat poorly-drained soils on slopes of 35 to 65 percent. These areas rarely have visible indications of instability.

Soil/landtypes in this class can be safely managed without a high risk of landslides by application of management practices designed to maintain the shear strength of soil and roots, and avoid increasing the effective weight of the soil mass. Management practices should be designed to avoid interrupting the natural surface and subsurface drainage patterns and minimize disturbance to the soil surface.

LOW

Soil/landtype units in this class have the least probability of landslides. Any slope failures that do occur are usually associated with included areas of incised stream channels (V-notches), or short steep escarpments. This class includes soils with slope gradients less than 35 percent.

These areas are normally not subject to sliding, however, management practices designed to protect streambanks and v-notches, and prevent surface erosion are appropriate.

Appendix C

APPENDIX C

ROAD MANAGEMENT OBJECTIVES

Road Management Objectives

Nearly all proposed roads in the analysis area would be located upon lands with a Tongass Land Management Plan land use designation of IV. This land use designation allows opportunities for intensive resource use and development where emphasis is primarily on commodity or market resources.

The one exception is that approximately 1.0 mile of proposed Road 6030 in Alternative 5 would be located upon LUD II lands.

The existing north Kupreanof Island road system was developed primarily for timber resource management. Two independent transportation networks exist; one road network is interconnected with the village of Kake and thus tied in with the Alaska Marine Highway system, the other network is an isolated road system in and around the east side of Portage Bay.

Kake Network

The Kake roads will be managed for a full array of multiple use management: timber access, roaded recreation and forest administration.

Portage Network

Due to the lack of public access by the Alaska Marine Highway and the absence of developed communities, the Portage Road network will primarily be managed for timber resource management. Timber resource management includes but is not limited to logging, Forest Service administration and thinning activities. Fish and wildlife enhancement projects, and some recreation use areas will be accessible from the road system.

Road Management

All Forest development roads on north Kupreanof Island will have a long-term service life designation. These roads so identified will be developed and operated for long-term land management and resource utilization needs.

There are three functional levels of service applicable to long-term service roads: arterial, collector and local. Arterial roads serve large land areas and provide for maximum ability for travel efficiency. Collector roads serve to collect traffic from local roads and provide both multiple purpose needs and travel efficiency. Local roads serve a specific resource activity (logging, for instance) and usually have one principal purpose for being open or operated even though minor uses exist.

Long-term roads are also managed by their predicted cycle of entry. There are two standard cycles of entry - constant and intermittent. If the road will have continuous or annual recurrent use, it is a constant service road. An intermittent service road is only needed for occasional use and is not used for periods that exceed one year.

Appendix D

APPENDIX D

TONGASS RESOURCE USE COOPERATIVE SURVEY MAPS AND LEGEND

Community abbreviation

- WR Community = Wrangell
- PE Community = Petersburg
- KA Community = Kake

Resource categories

- **EHD**- Ever Hunt Deer
- **MOD**- Most Often Hunted Deer
- **MRD**- Most Reliable Deer
- **PRD**- Previously Reliable Deer
- **SAL**- Salmon (Composite community data)
- **FIN**- Finfish other than salmon (Composite community data)
- **INV**- Marine Invertebrate (Composite community data)
- **MMM**- Marine Mammal (Composite community data)

Map Legend

- **HH**- Household

Different categories based on use numbers are delineated on the maps included in this appendix. The categories of numbers range from 0-1, 1-3, 3-5, 5-10, 10-20, and 20+ households using the specified area.

It is important to remember the resource categories when referring to the maps. For example, EHD (Ever Hunted Deer) could show use patterns, but they actually could be quite old, ranging from 50 years old to the present, and sporadic in nature. The possibility exists that the households being surveyed are using different areas now.

Bohemia Mountain TRUCS Data

EHD
wr Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

Mapscale
1:27597

Bohemia Mountain TRUCS Data

EHD
pe Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

Mapscale
1:27597

Bohemia Mountain TRUCS Data

EHD
ka Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

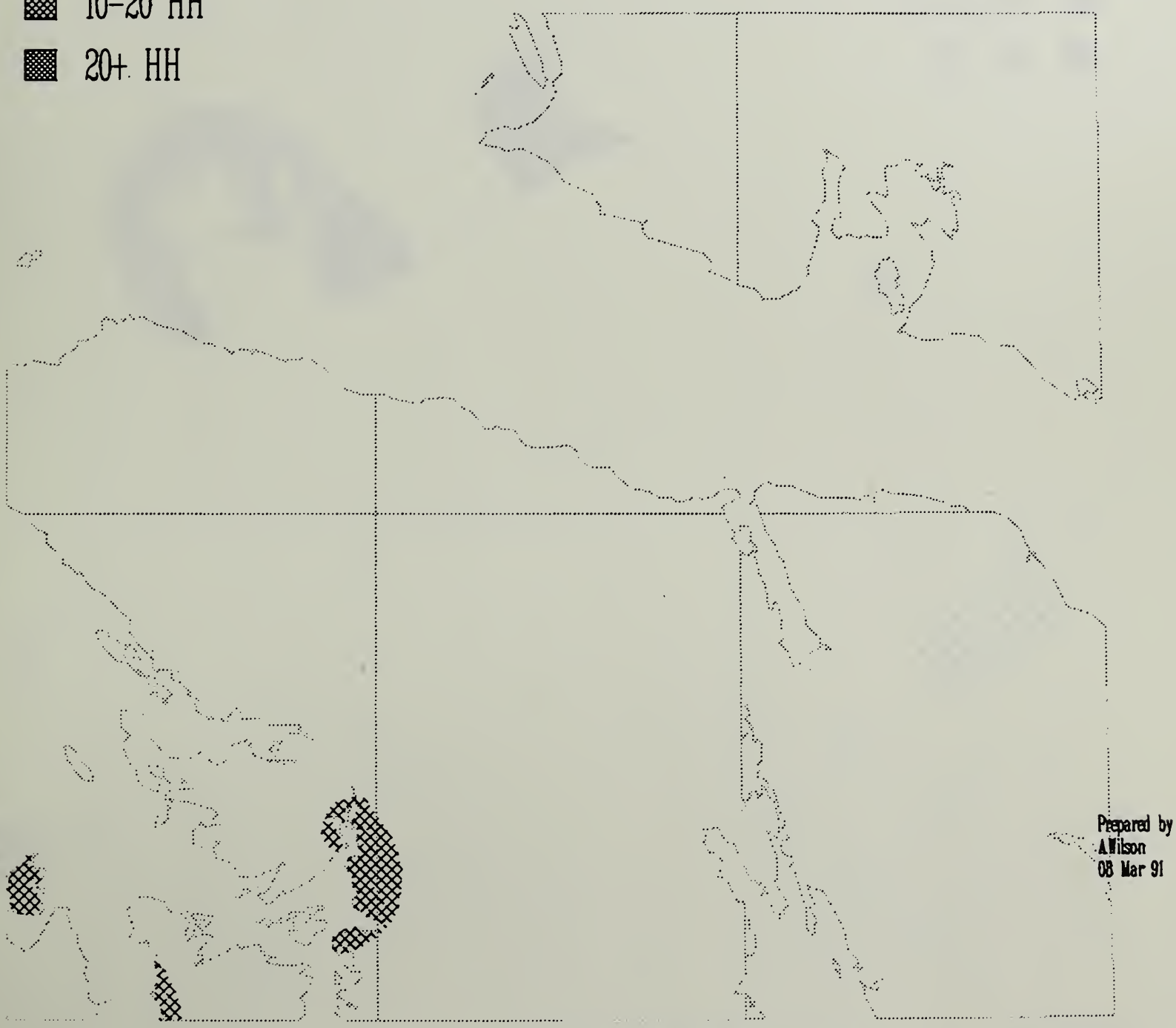
Mapscale
1:27597

Bohemia Mountain TRUCS Data

MOD
wr Community

- 0 -1 HH
- 1-3 HH
- 3-5 HH
- 5-10 HH
- 10-20 HH
- 20+ HH

Mapscale
1:27597



Bohemia Mountain TRUCS Data

MOD
pe Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

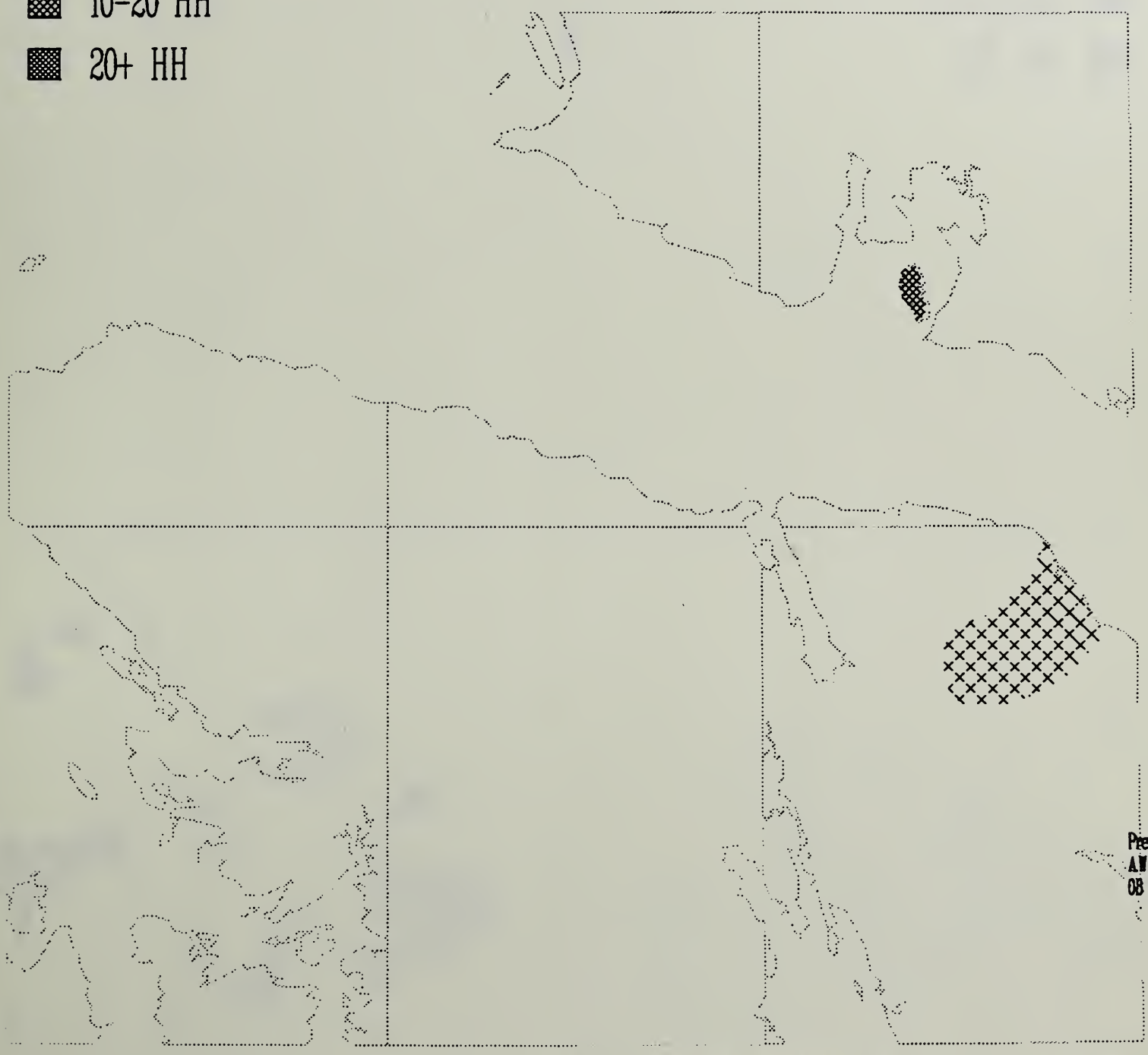
Mapscale
1:27597

Bohemia Mountain TRUCS Data

MRD
wr Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

Mapscale
1:27597



Prepared by
AWilson
08 Mar 91

Bohemia Mountain TRUCS Data

MRD
pe Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

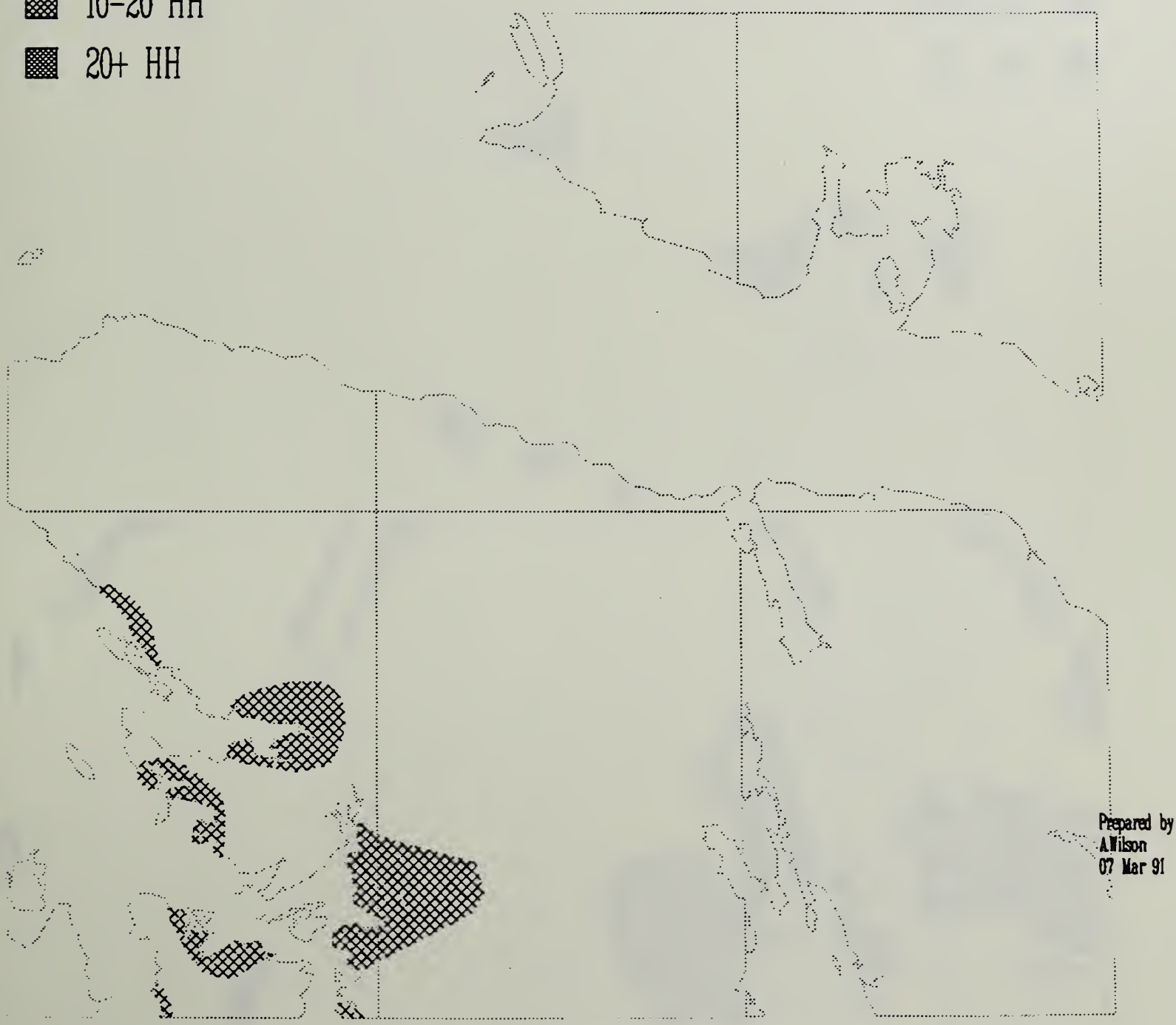
Mapscale
1:27597

Bohemia Mountain TRUCS Data

MRD
ka Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

Mapscale
1:27597



Bohemia Mountain TRUCS Data

PRD
wr Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

Mapscale
1:27597

Bohemia Mountain TRUCS Data

PRD
pe Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

Mapscale
1:27597

Bohemia Mountain TRUCS Data

PRD
ka Community

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

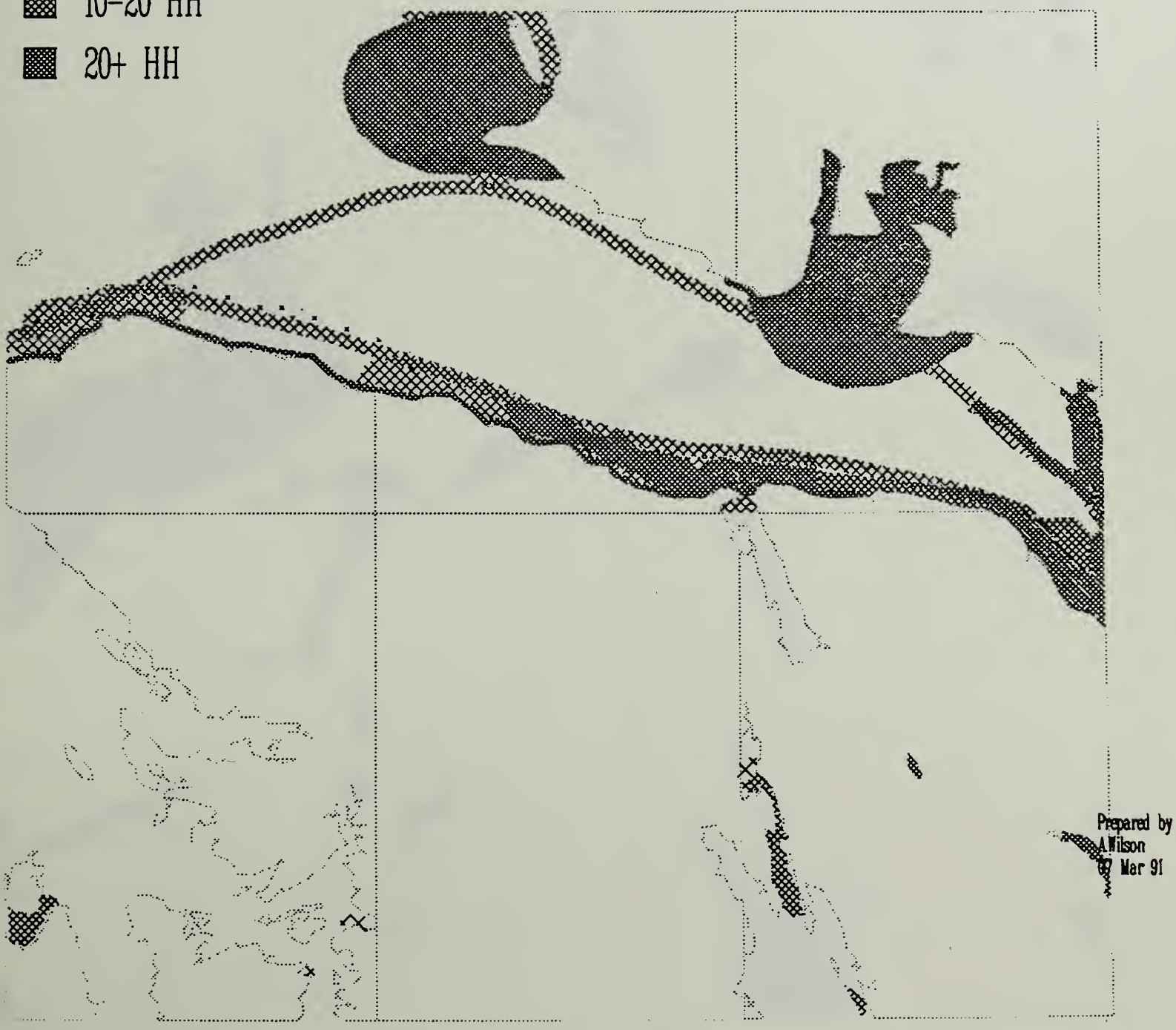
Mapscale
1:27597

Bohemia Mountain TRUCS Data

SAL

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

Mapscale
1:27597



Bohemia Mountain TRUCS Data

FIN

0 -1 HH
1-3 HH
3-5 HH
5-10 HH
10-20 HH
20+ HH

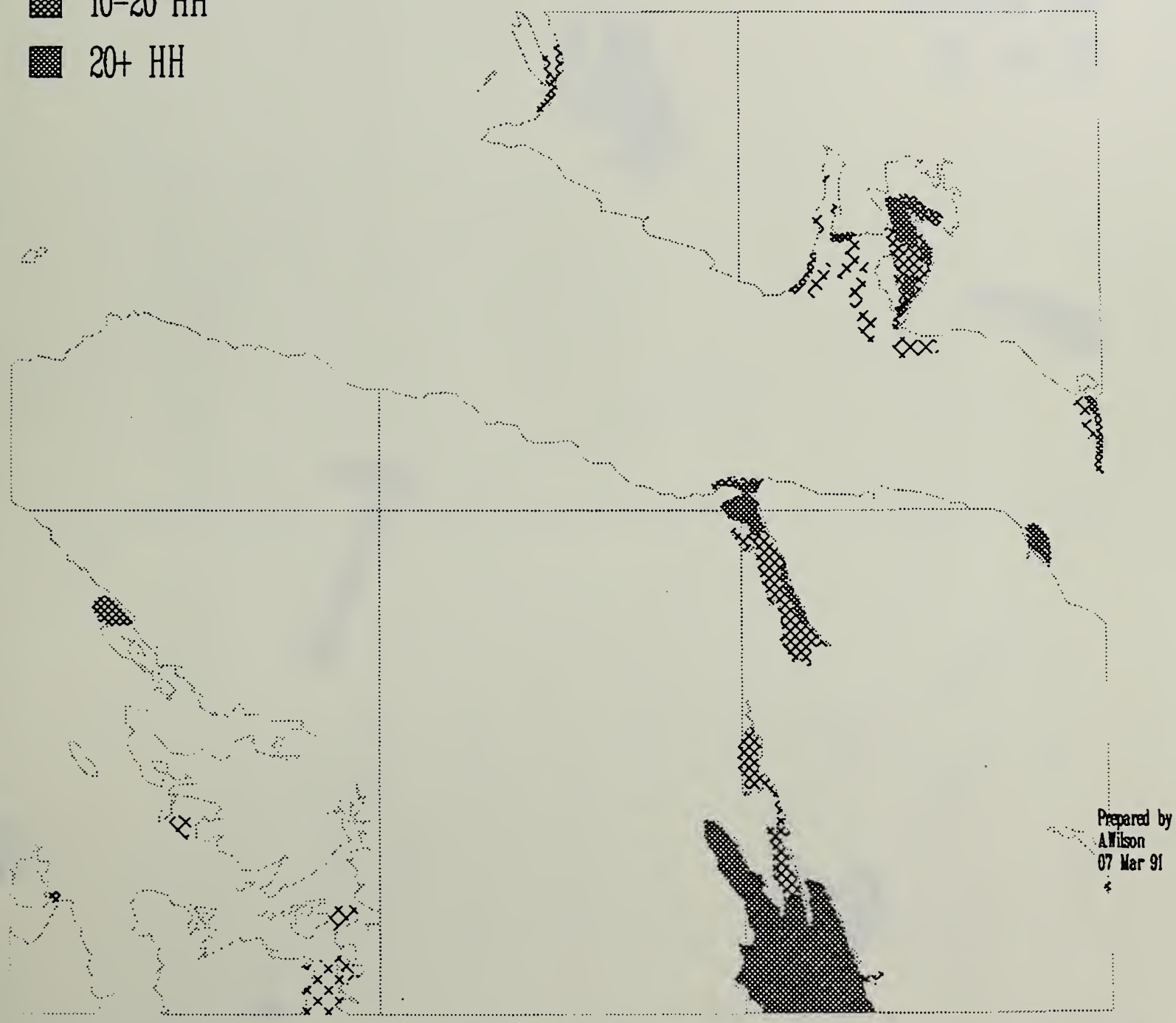
Mapscale
1:27597

Bohemia Mountain TRUCS Data

INV

- 0 -1 HH
- 1-3 HH
- 3-5 HH
- 5-10 HH
- 10-20 HH
- 20+ HH

Mapscale
1:27597



Bohemia Mountain TRUCS Data

MMM

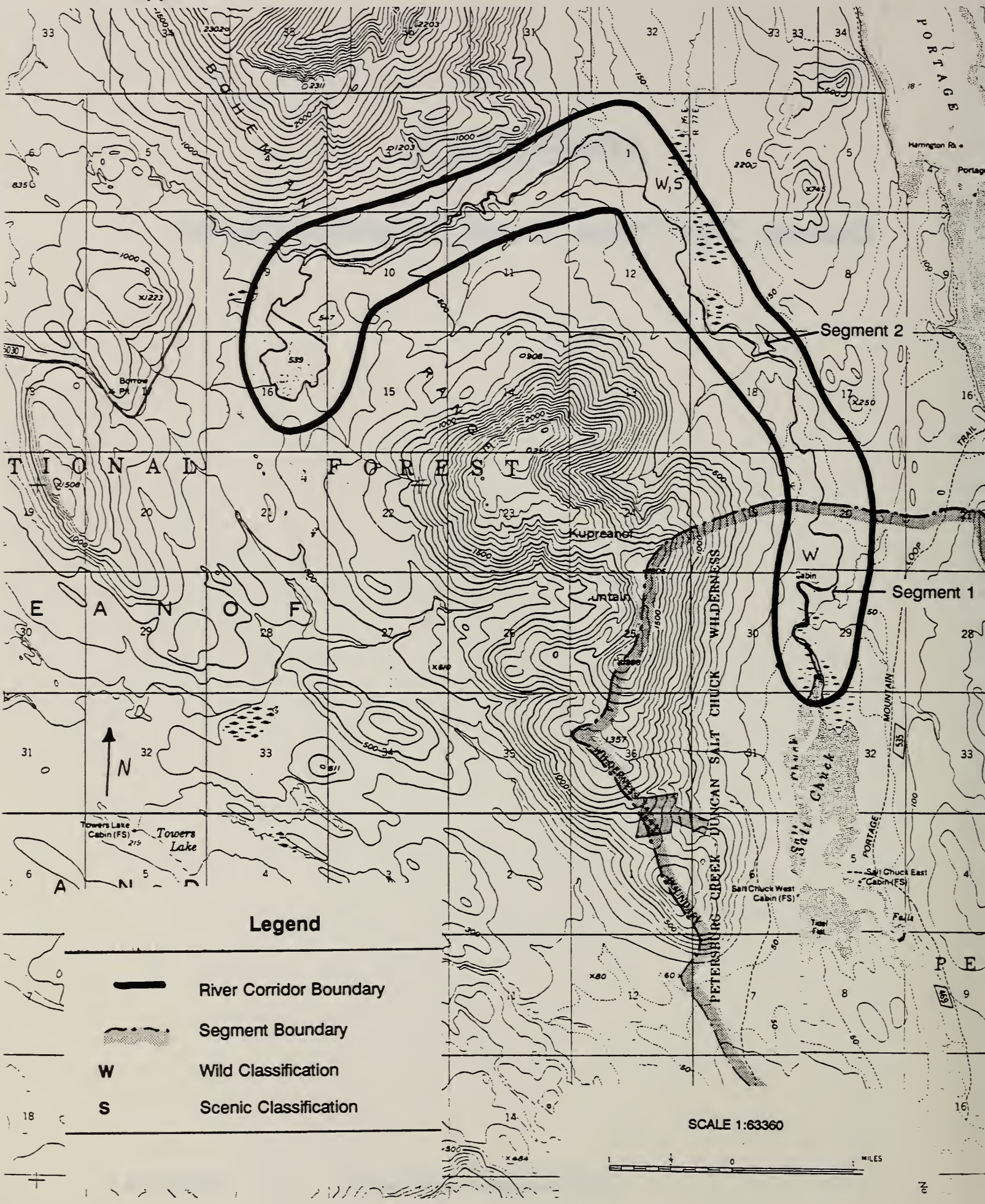
- 0 -1 HH
- 1-3 HH
- 3-5 HH
- 5-10 HH
- 10-20 HH
- 20+ HH

Mapscale
1:27597

Appendix E

APPENDIX E

Duncan Salt Chuck Creek Suitability Report


Segment 2
Segment 1
W,S
W
Kupreanof
Mountain
PETERSBURG CREEK - DUNCAN SALT CHUCK WILDERNESS
Salt Chuck
Salt Chuck East Cabin (FS)
Salt Chuck West Cabin (FS)
Towers Lake Cabin (FS)
Towers Lake
Borrow Pit
Harrington Rd
Portage
N
Legend
River Corridor Boundary
Segment Boundary
W Wild Classification
S Scenic Classification
SCALE 1:63360
MILES

APPENDIX E

Duncan Salt Chuck Creek Suitability Report

Description

Located on the Petersburg Ranger District, Tongass National Forest, in the Central Interior Islands Geographic Province, Duncan-Salt Chuck Creek originates at two small lakes located below 1,000 feet and flows approximately 12 miles into saltwater at the outlet of the salt chuck in Duncan Canal on Kupreanof Island. The stream has high fish values for steelhead, silver salmon, chum salmon, and cutthroat trout. Duncan-Salt Chuck Creek also has high wildlife (waterfowl and black bears), scenic, and recreation values, centered around the salt chuck. There are two Forest Service recreation cabins near the mouth of the creek on the salt chuck. There is a proposal for road construction and timber harvest in the headwaters of Duncan-Salt Chuck Creek which includes an arterial road from Kake to Portage Bay. The segment west of the stream is already constructed. The lower 3.9 miles of the stream lie within the Petersburg Creek-Duncan Salt Chuck Wilderness Area. The 1/2 mile river corridor contains 5,705 acres and is entirely on National Forest Lands, with the exception of intertidal lands around the salt chuck owned by the State.

Eligibility

Duncan-Salt Chuck Creek has outstandingly remarkable fish, recreation, wildlife, and scenic values of regional significance due to the concentration of these values in a small area. The Alaska Department of Fish and Game lists this stream as one of 19 high value watersheds in southeast Alaska. There are two Forest Service recreation cabins located in Duncan Salt Chuck. The Salt Chuck West cabin averaged 45 Recreation Visitor Days (RVD's) from 1988 through 1990 and the Salt Chuck East cabin averaged 531 RVD's during the same time period. These are registered use numbers. Actual use may be as much as 20 percent higher. A significant amount of the cabin use is by people from out of state. The outstandingly remarkable visual resource is related primarily to views from the salt chuck, which include snowcapped peaks of the Portage Mountain range outside the river corridor as a backdrop to the placid salt chuck water and the open grass flats. The rapids at the outlet of the salt chuck that flow both directions as the tide changes are an uncommon feature of rivers in southeast Alaska, and would be considered unique in other parts of the United States.

Classification

Duncan-Salt Chuck Creek meets the guidelines for "wild"classification for 12 miles. For analysis, two river segments were considered; Segment 1 from the falls at the outlet of the salt chuck upstream to the Wilderness boundary and Segment 2 from the Wilderness boundary upstream to Bohemia Lake.

Alternatives

A. "Wild River" designation for all 12 miles,

B. "Wild River" designation in Wilderness (3.9 miles) and Scenic River designation upstream from Wilderness boundary for 8.1 miles,

C. No designation as a component of the Wild and Scenic Rivers system, and

D. "Wild river" designation in Wilderness only, no designation upstream.

The alternative of recommending Segment 2 as a recreation river was not studied. There is no forseeable development that would render the river ineligible for consideration as a "scenic" river, which is more restrictive than the "recreational river" designation.

Suitability

Suitability Factor #1: Characteristics which do or do not make the area a worthy addition to the National System

Duncan-Salt Chuck Creek is typical of streams in the rolling terrain of the Kupreanof lowlands. Its wildlife and fish values, scenic value associated with the views in and from the salt chuck, and recreation values associated with the salt chuck and lower river, considered in combination, are of regional significance. The stream is one of 17 eligible rivers which potentially represent the Central Interior Islands geographic province. As a representative example of streams on the Kupreanof lowlands, it is similar to Castle River and Petersburg Creek, and in that context would not be considered unique. It is one of three eligible rivers in the Central Interior Islands that includes an intertidal lagoon (salt chuck), a feature relatively common in southeast Alaska but not well represented in the National System.

Suitability Factor #2: Current status of land ownership and use in the area including the amount of private land and the uses of such land.

There are no private lands within the corridor. One valid existing mining claim west of the corridor would not be affected by designation. There is no private land and no effect on private land use. The State owns the intertidal lands within the salt chuck and is responsible for permitting use on such lands; there are currently no known plans for State authorization of land uses which would conflict with a wild river designation in Segment 1. A State plan was approved in 1984, for a Kake Coastal Management Program. This does not include any area within the tentatively eligible river corridor. (R. W. Pavitt and Associates, 1984).

Suitability Factor #3: Forseeable potential uses of the land and water that would be enhanced, foreclosed or curtailed by designation; and values which would be foreclosed or diminished if the area is not protected as part of the National System.

Transportation: Designation of Segment 1 as a wild river has no effect on present or future transportation system opportunities. A state highway connecting Kake and Petersburg within the corridor has been identified by the state as a vital transportation link. Designation of Segment 2 as a "wild river" would deny the opportunity for future construction of this highway. Alternate routes, if available, would likely have higher construction costs, and could increase environmental impacts, particularly on soil and water, associated with road construction on steeper slopes and less suitable soil types outside the corridor. Designation of Segment 2 as a scenic river would allow for the future construction of the State Highway on the planned location, with two road bridges across the river.

Water Resources: The area has no identified potential for water and power development and there are no existing powersite withdrawals. Designation as a wild river would be unlikely to affect the future availabilty of water supplies or electric power.

Mineral Resources: Segment 1 (Wilderness) is currently withdrawn from mineral entry. As a wild river, Segment 2 would be withdrawn from mineral entry; the absence of existing claims or known mineral resources indicate the withdrawl would likely have no significant effect on the availability of mineral resources. As a scenic river, Segment 2 would remain open to mineral entry.

Timber: Designation of Segment 1 as a wild river would have no effect on timber production because the area is currently in Wilderness. Designation of Segment 2 as a wild river would increase the cost of access to timber resources on the Bohemia Range north and west of the river corridor, and may foreclose access to timber on the west side of Portage Bay from the Hamilton Creek road. Access to timber resources from other locations east of the river corridor and in Portage Bay would also require construction of additional roads and log transfer facilities at higher cost. Designation of Segment 2 as a wild river would eliminate potential harvest on approximately 947 acres of suitable forest lands within the river corridor, with potential volume of 1.57 MMBF. Designation of Segment 2 as a scenic river would allow restricted timber harvest on 947 acres of suitable forest land. Harvest activities would be limited and would use silvicultural treatments which would ensure compatibility with visual objectives for a scenic river designation. Intensity of harvest would be dependent on the landscape's ability to visually absorb the proposed activity.

Fisheries and Wildlife: Designation as a wild river would maintain existing habitat conditions and may serve as a corridor for movement of riparian and old growth dependent species. Development of potential fish habitat enhancements in Segment 2 would require appropriate access and design at potentially higher cost, or could preclude development. Designation of Segment 2 as a scenic river would allow typical fish habitat enhancement projects, increasing the potential for increased fish production. Stocking and fertilization of the small lakes in Segment 2, to enhance recreation opportunity, would be allowed in either designation.

Recreation and Subsistence: Designation as a wild river would maintain the current primitive/semi-primitive recreation opportunities. Access and competition for subsistence resources would remain unchanged. Most recreation and subsistence activity would continue to center around the salt chuck and lower reach of the river within the Wilderness. Designation of Segment 2 as a scenic river could increase access for some subsistence uses and enhance semi-primitive and roaded recreation opportunities if the road extension from Kake were to be constructed. Competition for subsistence resources could increase.

Scenic Resources: Because Segment 1 is within the Wilderness, designation as a wild river would not alter the current visual quality objective of "preservation", which allows only ecologic changes to the landscape. Designation of Segment 2 as a wild river would preserve the unmodified landscape within the river corridor. Visual quality outside the corridor would be managed in accordance with adjacent 3and use designation. The visual quality objectives for these adjacent lands may recommend that management activities be designed to be unnoticeable or to appear only as minor disturgances. Designation of Segment 2 as a scenic river would retain the visual character within the corridor as seen from the river, while areas outside the corridor would be subject to the visual quality objectives of adjacent land use designations. The VQO's for these adjacent lands may allow management activities to be noticeable, but they should resemble natural landscape patterns.

Effects of non-designation: Outstandingly remarkable scenic, recreation and wildlife values, concentrated in Wilderness in Segment 1, would not be adversely affected if the river were not designated as a wild river. There is a potential in Forest Plan Revision Alternatives C and D that timber would be harvested within the corridor in Segment 2 subject to stream buffer requirements and management standards and guidelines specified in the Stream and Lake Protection and Use Designation. Harvest in this segment would reduce the primitive character of the area and may increase access for recreation and subsistence uses. Fish habitat values and sport fishing are adequately protected in Segment 2 by the application of the stream buffer requirement of the Tongass Timber Reform Act and the management standards and guidelines. Timber harvest on lands adjacent to the corridor in Segment 2 would likely be visible from the corridor; however, since scenic values were not considered outstandingly remarkable in this segment, this would not affect river values.

Suitability Factor #4: Public, State and local governmental interests

The State maintains a strong interest in the opportunities for future development of transportation and other infrastructure to support orderly growth and viability of communities and may view a designation as unacceptable despite ANILCA allowance for location of transportation and utility corridors within conservation system units. The possibility of constructing a road which connects Kake and Petersburg (identified in the Southeast Alaska Corridor Plan) has been the subject of local controversy, with some residents in and near these communities opposed to a road link and others in favor. This issue was a factor in determining the present boundary of the Petersburg Creek-Duncan Salt Chuck Wilderness so that the possible road corridor area was not included in the Wilderness. While not directly related to the suitability of the river, this ongoing public debate creates an atmosphere in which a proposal by the Forest Service to either extend the road on this alignment connecting Kake and Portage Bay, or designate Segment 2 as a wild river, possibly affecting the road opportunity, could affect the ability of the State to respond to transportation issues. No public comment on the Revision Draft Environmental Impact Statement specifically referring to Duncan-Salt Chuck Creek has been received, although one national environmental organization has indicated an interest in the potential for designation.

Suitability Factor #5: Estimated cost of land acquisition and managment as a wild and scenic river

There would be no acquisition of private lands, no recreation or other developments are proposed for the area, and planning and management costs are relatively low because the portion of the river with significant public uses is within the Wilderness. The following are the expected *additional* funding needs for a five year period if the river were designated:

General Administration	not estimated
Cost of Implementation	$ 5,000 total
Management Plan Development	$ 20,000 total
Development Costs	$ 0 total
Operation and Maintenance	$ 2,500 annual
Total- First Five Years	$ 37,500

Suitability Factor #6: Other Issues and concerns

Appendix F

UNIT SUMMARY

The following is a capsulation of the interdisciplinary team analysis of each unit proposed for harvest in all of the alternatives studied in detail. These summaries are used in the unit card process for monitoring each unit from the planning phase to the implementation phase to the monitoring phase of activities. The unit cards are part of the planning file and may contain more information than is displayed in the NEPA document. The objective of the Planned Unit Card is to display an efficient two-page documentation of the unit objective summary; unit attributes; resource concerns, management objectives, and mitigation direction; prescription summary; and unit map. More detailed information may be available in the planning file. The Planned Unit Cards will continue to be used through the layout and monitoring phases as described in the Forest Service Manual.

It has to be anticipated that there will be some minor changes to the units as depicted on these planned cards. It is virtually impossible without field verification of every unit boundary and road location not to have some changes. Exact conformance to preset lines, regardless of values, would not be proper management. Opportunities to not only protect newly discovered situations but also to optimize management intent without changing the environmental impacts have to be anticipated and instituted. The resources, as they are now known and analyzed, have been protected or enhanced to the greatest extent practicable.

If changes and impacts develop which are outside the scope of the impacts envisioned with this environmental documentation, additional documentation may be required.

In the review of the Planned Unit Cards, specific resource concerns, management objectives and mitigation direction is identified to aid in the layout of the unit when selected for harvest. This selection process culminates after the environmental analysis and a decision is documented by the Forest Service. A brief description of the Planned Unit Card contents follows:

Unit Objectives Summary

This section of the Planned Unit Card describes how and why a unit is being proposed for harvest. This section may include which harvest system we are planning to use based on stand and topography attributes. The main resource concerns for a particular unit are briefly described along with the mitigation direction for incorporation in the envisioned harvest. These directions will be the basis of the unit layout in conjunction with the mitigation measures identified below.

Unit Attributes

Unit Volume

The volume data for the Bohemia Mountain Study Area exists in three forms which include the following: timber type maps (GIS TIMTYP layer), the subsequent stand data, and the soils classification maps (GIS CLU and TIMTYP layers) which infer the forest cover type and timber productivity classification based upon the soils type. The soils inventory was selected as the basis for the timber inventory (Ron Humphrey's letter of direction 9/1/89). Aerial photo analysis and field verification adjusted the soils inventory to a timber inventory for a timber type and volume class determination which is the most up-to-date information available.

Net Saw: Total sawlog volume for the planned harvest unit.
Saw/Util: Total sawlog plus utility volume for the planned harvest unit.
Volume/Acre (net Sawlog): Sawlog volume in thousand board feet (MBF) per acre.

Resource Concern (C), Management Objectives (O), and Mitigation Direction (D)

This section of the Planned Unit Card describes the specific resource values of the unit that may be affected by timber harvest activities. Due to the resource concern associated with the unit, management objectives are identified for the resource potentially affected. Once the objective is identified, mitigation direction is identified on how the resource will be protected, including referencing the appropriate Best Management Practices (BMP's). Individual resources are specified based on interdisciplinary review of each of the units identified as being selected in each of the Forest Service Alternatives.

Prescription Summary

This section of the Planned Unit Card describes the proposed activities that will take place in the proposed unit after harvest occurs. The objectives and direction in this section are based on current prescriptions of what is to be performed in the near and long-term future for the harvested stand. During unit layout, modifications may be made to this direction by more detailed site-specific prescriptions. The following list describes this section:

OBJ: Stand management objective (i.e., timber harvest production).
SITE PREP: Seedbed preparation method necessary for reforestation.
REGEN: Type of regeneration method used to revegetate the unit.
THIN: Year thinning is anticipated to occur.
SPACING: Spacing in feet between trees remaining after thinning.
ROTATION: Anticipated rotation age for second entry into unit.
CONTROL: Manipulation of vegetation to control undesirable species.
ENHAN: Tree growth measures anticipated to enhance stand development.
MONITORING: When reforestation surveys will be conducted.
CERT: Anticipated date of reforestation certification. All stands will meet certification requirements within five years, as required by the National Forest Management Act.

Unit Map

The unit map is provided to give a visual representation of the management direction for the proposed harvest unit. This visual representation of how the IDT envisioned the unit to be harvested will be used in the layout of the unit prior to offering the sale. If unit changes are necessary due to information found on the ground to be conflicting with the proposed activities, these changes will be documented in the implementation cards. Additional environmental documentation of the changes will be necessary and will accompany the implementation cards should the change be identified as a significant departure from the original decision.

Suspension/ Logging Requirements

A few of the items that may need clarification on the map are as follows:

Partial: Only one end of the log touches the ground during the yarding cycle. Normally attainable with cable yarding systems with the location of proper tailholds in coordination with topographic features. (Shown with a "P" on the map.)

Cable: Describes high-lead or other similar type equipment. No suspension requirements are specified. (Shown with a "C" on the map.)

Shovel: Relatively new in use in southeast Alaska, shovel yarding uses equipment in harvest units on generally flat ground to individually pick up and move logs toward a landing. Minimal ground disturbance can be achieved by this system and some roading options may be avoided. (Shown with an "S" on the map.)

Helicopter: Helicopter yarding is normally identified with full suspension requirements for areas that are difficult to access. It is envisioned that all helicopter units will be logged in this manner. However, it has to be anticipated that the purchaser may choose to helicopter some of the cable units and also may find a suitable method to cable log some helicopter units. If the proposed change is outside the scope of the analysis, then a new analysis will be required. (Shown with an "H" on the map.)

Preferred Alternative Units

Alternative 5A is the Preferred Alternative. All units numbered with an "A", as shown on the unit plan, maps are in this alternative.

Stream Buffers

The Tongass Timber Reform Act passed legislation requiring all Class I (anadromous fish) streams and all Class II (resident fish) streams tributary to Class I streams to have a minimum 100 foot buffer along both sides of the stream channel. These buffers do not allow harvest activities to occur within their boundaries. Class III (water quality) streams may or may not have buffers on them dependent on what the water quality needs are downstream. These buffers may allow for the harvest of portions of the stand through the use of individual tree marking methods.

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 27
Unit Number(s): 201, 401, 501, 501A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Spur road will be located at the top of the V-notch. Unit will be planned for high-lead yarding.

UNIT ATTRIBUTES

Predominant Species: W. hemlock
Age Class: 200+
Unit Volume: 610 MBF Net Saw 658 MBF Saw/Util
Volume/Acre (net Sawlog): 23 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries

C: Sensitive streambanks and soils along low-gradient channel bisecting unit.

O: Minimize disturbance of the banks and nearby organic soils (BMP 13.16 O3 & O5).

D: Directional fell trees away from the channel, using channel as a yarding splitline, or recommend full suspension across channel and organic soils (BMP's 13.9, 13.16 E10 & E11)

Transportation

C: Uneconomical to cross the V-notch at midslope.

O: Cross the V-notch at a narrow point.

D: Locate the road at the top of the unit to avoid the V-notch.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A ; REGEN: Natural ; THIN: PCT - 15-20 yrs; SPACING: 16'x16' ;
ROTATION: 100 yr.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP

2-201 4-401 5-501 5A-501A

	Unit Boundary		Stream - Class I
	Harvest System Boundary		Stream - Class II
	Existing Specified Road		Stream - Class III
	Existing Road - Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 62
Unit Number(s): 202, 402, 502, 502A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Ensure that a 500' uncut timbered block between this unit and 503A be retained as a wildlife travel corridor for thermal and hiding cover. Split-line yarding away from V-notch in northern end of unit.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 1,544 MBF Net Saw 1,655 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: Harvest of unit will change ROS class to Road Modified (RM). It is presently Roaded Natural/Semiprimitive Non-Motorized.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Integrity of the sideslope stability of the V-notch on the north portion of the unit may be jeopardized.
O: Maintain sideslope stability (BMP 13.16 O3 & O5).
D: Split settings on the V-notch (BMP 13.16, E11).

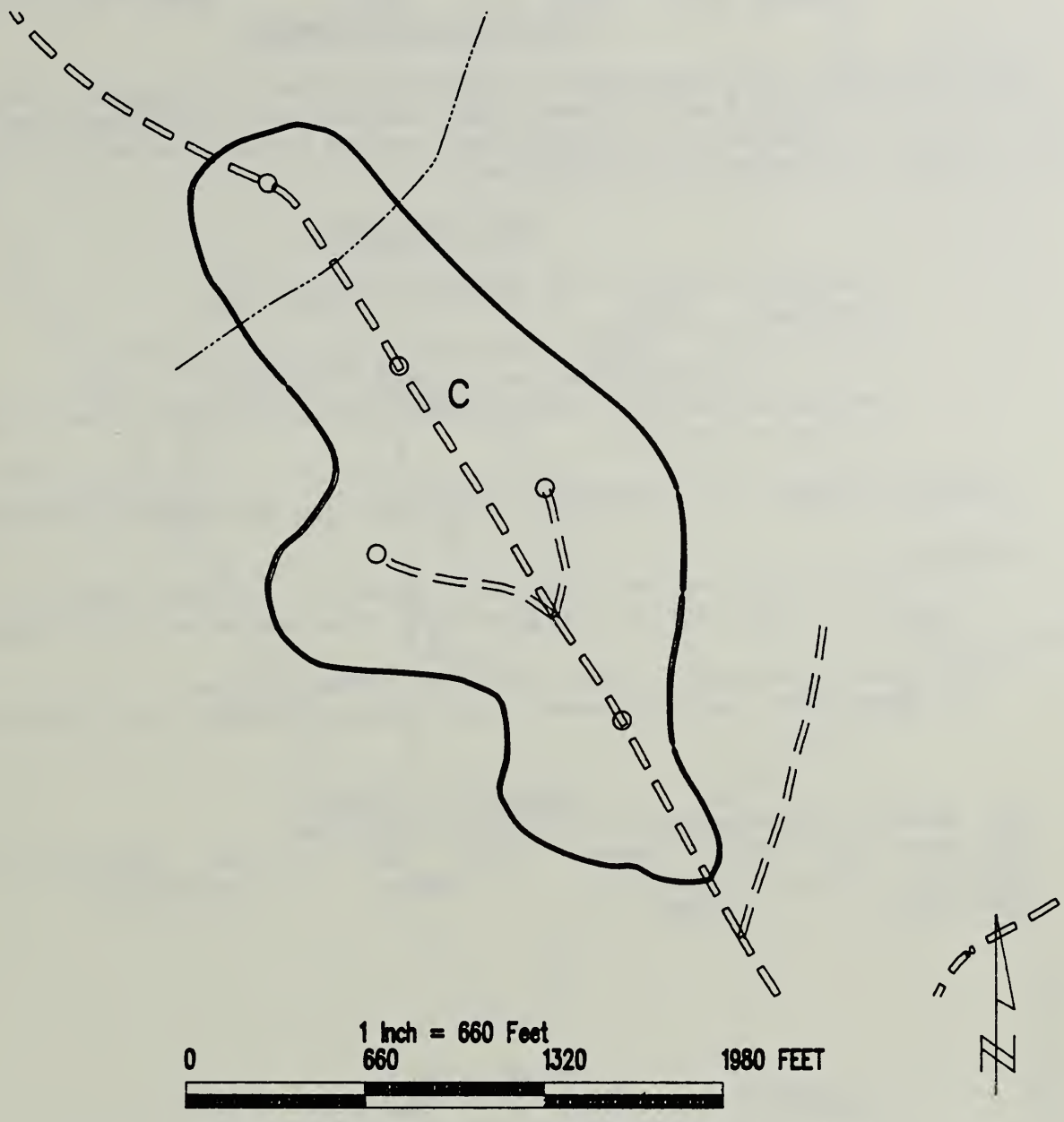
Wildlife
C: Travel route between Duncan Salt Chuck and West Bohemia Mt. will be impacted. This unit is a medium value pine marten and deer habitat (HSI: $\leq$.6).
O: Maintain adequate travel corridors between units.
D: Leave >500' uncut timbered strip between proposed units 503A and 502A.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged
SITE PREP: N/A; REGEN: Natural ; THIN: PCT - 15-20 yrs.; SPACING: 16'x 16' ;
ROTATION: 100 yr.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP

2-202 4-402 5-502 5A-502A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 10
Unit Number(s): 203, 403, 503, 503A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Ensure that a 500' uncut timbered strip between this unit and units 502A and 504A (unit 504A has been dropped thus mitigating this concern) be retained as a wildlife travel corridor for thermal and hiding cover.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, Alaska-cedar
Age Class: 200+
Unit Volume: 125 MBF Net Saw 141 MBF Saw/Util
Volume/Acre (net Sawlog): 13 MBF
Recreation Setting: Harvest would change ROS class from Roaded Natural to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Wildlife

C: Travel route between Duncan Salt Chuck Cr. and West Bohemia Mt. will be impacted. This unit is a medium value pine marten and deer habitat (HSI: $\leq$.6).

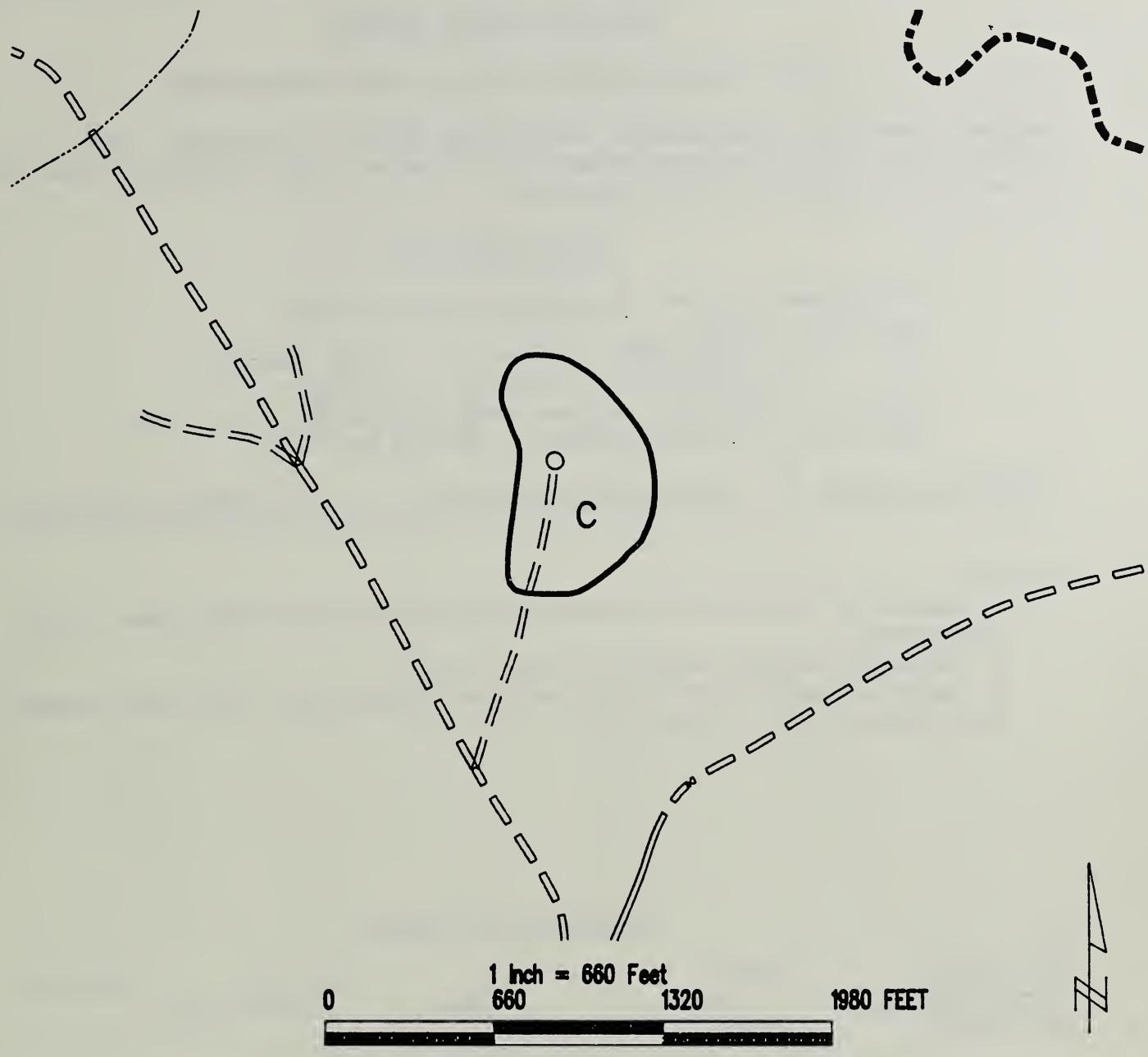
O: Maintain adequate travel corridors between units.

D: Leave >500' uncut timbered strip between proposed units 503A and 502A.

PRESCRIPTION SUMMARY

OBJ: Natural Regeneration/conversion to even-aged.
SITE PREP: N/A ; REGEN: Natural ; THIN: PCT - 15-20 yrs.; SPACING: 16'x 16' ;
ROTATION: 100 yrs. ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-203 4-403 5-503 5A-503A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 19
Unit Number(s): 204, 404, 504, 504A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

DUE TO ROAD LOCATION THIS UNIT HAS BEEN DROPPED

Harvest timber for regeneration, converting stand to even-aged. Leave at least a 500' uncut strip of timber between Unit 504A and 502A and 503A to the south to serve as a wildlife travel corridor.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, Alaska-cedar
Age Class: 200+
Unit Volume: 237 MBF Net Saw _____ MBF Saw/Util
Volume/Acre (net Sawlog): _____ MBF
Recreation Setting: Harvest would change ROS class from Semi-Primitive Non-Motorized to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Wildlife
C: Impact to travel route between Duncan Salt Chuck Creek Area & West Bohemia Mt.
O: Maintain adequate wildlife travel routes.
D: Leave at least a 500' uncut corridor between Unit 504A and proposed Units 502A & 503A to the south.

PRESCRIPTION SUMMARY

OBJ:
SITE PREP: ; REGEN: ; THIN: ; SPACING: ; ROTATION:
INSECT/DISEASE: ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 77
Unit Number(s): 205, 405, 505, 505A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. V-notch instability and high propensity toward blowdown disallows leaving strips/clumps of and individual green trees. Need a minimum of partial suspension across all Class III streams (in the center of the unit in particular) and all V-notches to mitigate soil instability concerns in this unit. When marking the unit boundaries the soil scientist needs to be involved.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce, Alaska-cedar
Age Class: 220+
Unit Volume: 1,632 MBF Net Saw 1,766 MBF Saw/Util
Volume/Acre (net Sawlog): 21 MBF
Recreation Setting: Harvest would change ROS class from Semi-Primitive Non-Motorized to Road Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries

C: Instability of V-notch sideslopes on water quality streams. Leave-trees near V-notches may blow into streams increasing the soil and sideslope instability.

O: Minimize sideslope disturbance, and protect water quality in Class III streams which influence fisheries downstream (BMP 13.16 O1, O3, & O5).

D: Utilize streambanks as unit boundaries on northwest and southeast sides (BMP 13.2), minimize debris loading of all channels mapped (BMP 13.16, E5). Use splitline or partial suspension across V-notches within the unit (BMP's 13.9; 13.16, E11).

Wildlife

C: Loss of stand structure may jeopardize moderate to high pine marten and deer habitat (HSI: $\geq$.7).

O: Maintain wildlife habitat.

D: Retain small clumps or strips of green trees along Class III streams if windfirm, where soil stability is not a problem. (Due to soil instability, small clumps or strips of green trees cannot be retained.)

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/coversion to even-aged.
SITE PREP: N/A ; REGEN: Natural ; THIN: PCT - 15-20 yrs.; SPACING: 16'x 16';
ROTATION: 100 yrs ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP

2-205 4-405 5-505 5A-505A

	Unit Boundary		Stream - Class I
	Harvest System Boundary		Stream - Class II
	Existing Specified Road		Stream - Class III
	Existing Road - Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 78
Unit Number(s): 206, 406, 506, 506A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. V-notch instability and high propensity toward blowdown disallows leaving strips/clumps of and individual green trees. Need a minimum of partial suspension across all Class III streams and all V-notches to mitigate soil instability concerns in this unit.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 1,198 MBF Net Saw 1,327 MBF Saw/Util
Volume/Acre (net Sawlog): 15 MBF
Recreation Setting: Harvest would change ROS class from Semi-Primitive Non-Motorized to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries

C: V-notch instability may be a concern, and their influence in maintaining water quality.

O: Minimize sideslope disturbance in V-notches, and protect water quailty in Class III streams which influence fishery concerns downstream (BMP 13.16 O3 & O5).

D: Where channels form unit boundaries, harvest to streambanks utilizing directional felling and leave sub-merchantable trees, any alder, and advanced regeneration (BMP 13.16 E11 & E12). Partial suspension across Class III channels within the unit, or use them as splitlines where appropriate (BMPs 13.9, 13.16 E11). Avoid debris loading in V-notches (BMP 13.16, E5).

Wildlife

C: Loss of stand structure may jeopardize moderate to high pine marten and deer habitat (HSI: >.7).

O: Maintain wildlife habitat.

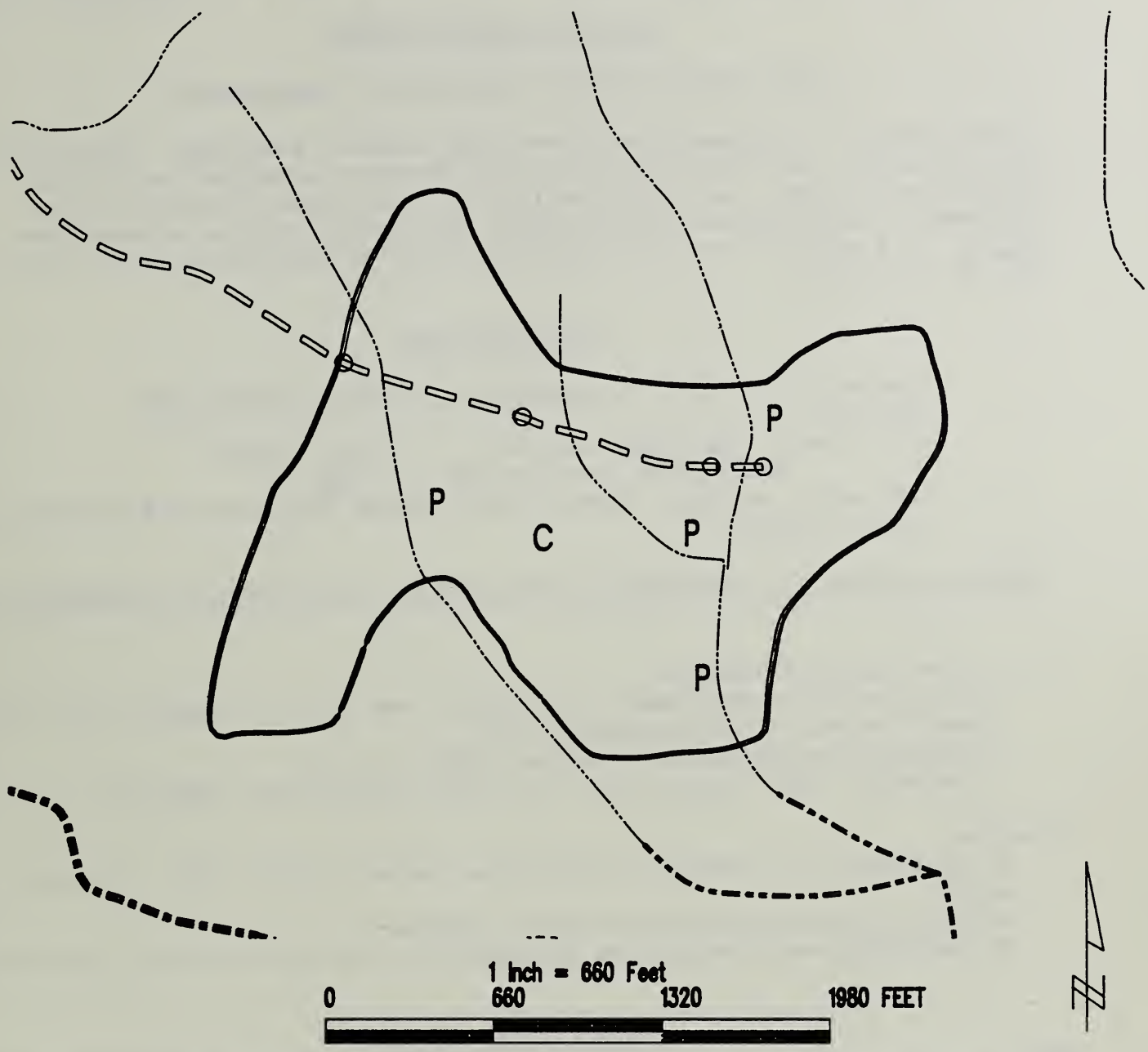
D: Retain small clumps or strips of green trees along Class III streams if windfirm, where soil stability is not a problem. (Due to soil instability, small clumps or strips of green trees cannot be retained.)

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A ; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs. ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP

2-206 4-406 5-506 5A-506A



	Unit Boundary		Stream - Class I
	Harvest System Boundary		Stream - Class II
	Existing Specified Road		Stream - Class III
	Existing Road - Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 19
Unit Number(s): 207, 407, 507, 507A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

DUE TO ROAD LOCATION THIS UNIT HAS BEEN DROPPED

Harvest timber for regeneration, converting stand to even-aged. Maintain an uneven-aged 50 - 100' strip along the unit boundary opposite the logging setting (complements the logging logistics) to mitigate wildlife concerns; intermediate and suppressed trees within this buffer will be retained when logging. A biologist and silviculturist should collaborate with the layout crew on this unit.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce, Alaska-cedar
Age Class: _____
Unit Volume: 16 MBF Net Saw _____ MBF Saw/Util
Volume/Acre (net Sawlog): _____ MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Siols/Water Quality/Fisheries
C: Degradation of anadromous fish habitat may occur if logging occurs on Class II stream on NE boundary of unit.
O: Maintain anadromous fish habitat (BMP 13.16 05).
D: Maintain a 100' uncut buffer of timber along stream (BMP 12.6)

Wildlife
C: Degradation of moderate to high pine marten habitat (HSI: .75) may occur.
O: Need to maintain some pine marten habitat.
D: Maintain some diversity in the stand by leaving some trees in the unit.

PRESCRIPTION SUMMARY

OBJ:
SITE PREP: ; REGEN: ; THIN: ; SPACING: ; ROTATION:
INSECT/DISEASE: ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 70
Unit Number(s): 208, 408, 508, 508A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. V-notch instability and high propensity toward blowdown disallows leaving strips/clumps of and individual green trees. Need a minimum of partial suspension across all Class III streams and all V-notches to mitigate soil instability concerns in this unit.

UNIT ATTRIBUTES

Predominant Species: W. hemlock
Age Class: 200+
Unit Volume: 1,607 MBF Net Saw 1,730 MBF Saw/Util
Volume/Acre (net Sawlog): 23 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries

C: V-notch instability and their influence on maintaining water quality could be a problem.

O: Minimize sideslope disturbance in V-notches to reduce the risk of mass wasting, and protect water quality which influence fisheries concerns downstream (BMP 13.16 O1, O3, O5, & O6).

D: Maintain a 200' uncut buffer, (BMP 12.6), between the mainstream and the unit boundary (running the length of the mountainslope) and at the southwestern corner (BMP 13.2). Split line on or partial suspend across V-notches and all Class III channels within the unit, and avoid debris loading of channels (BMP 13.9, 13.16 E5 & E11).

Wildlife

C: Loss of stand structure may jeopardize future biodiversity.

O: Maintain diverse wildlife habitat.

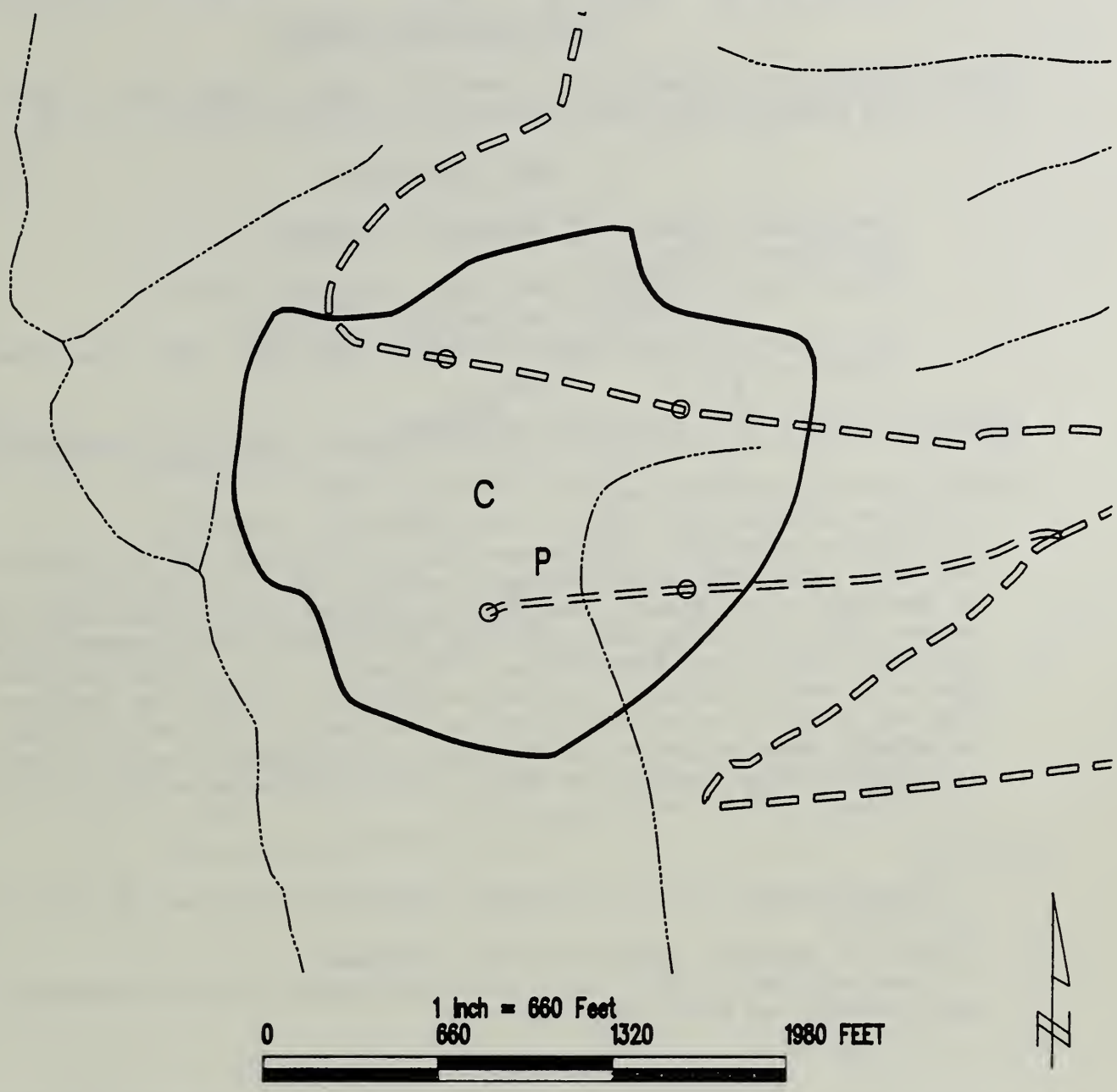
D: Retain small clumps or strips of green trees along Class III streams, where soil stability is not a problem. (Due to soil instability, small clumps or strips of green trees cannot be retained.)

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A ; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16' ;
ROTATION: 100 yrs. ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP

2-208 4-408 5-508 5A-508A



	Unit Boundary		Stream - Class I
	Harvest System Boundary		Stream - Class II
	Existing Specified Road		Stream - Class III
	Existing Road - Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 31
Unit Number(s): 209, 409, 509, 509A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Leave 300' uncut strip between Units 508A & 509A for a wildlife travel corridor.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 832 MBF Net Saw 915 MBF Saw/Util
Volume/Acre (net Sawlog): 27 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries

C: Slope stability of V-notch on northern unit boundary.

O: Minimize sideslope disturbance through reducing risk of windthrow of residual stand and subsequent mass wasting (BMP 13.16 O3 & O5).

D: Northern unit boundary should be on V-notch slope break/ridge top as mapped (BMP 13.2 E8 & E10). However, where the yarding capability exists and the risk to soil disturbance is minimal, it is recommended that the dominant and co-dominant trees up to about 50' outside the boundary (near the top of the V-notch side slope) be felled into the unit and yard within an attempt made to leave intermediate and suppressed trees in place (BMP 13.2 E10). This should help reduce the destabilizing effect of wind on the side slope.

Wildlife

C: Fragmentation and loss of travel corridors to Duncan Salt Chuck Creek will occur.

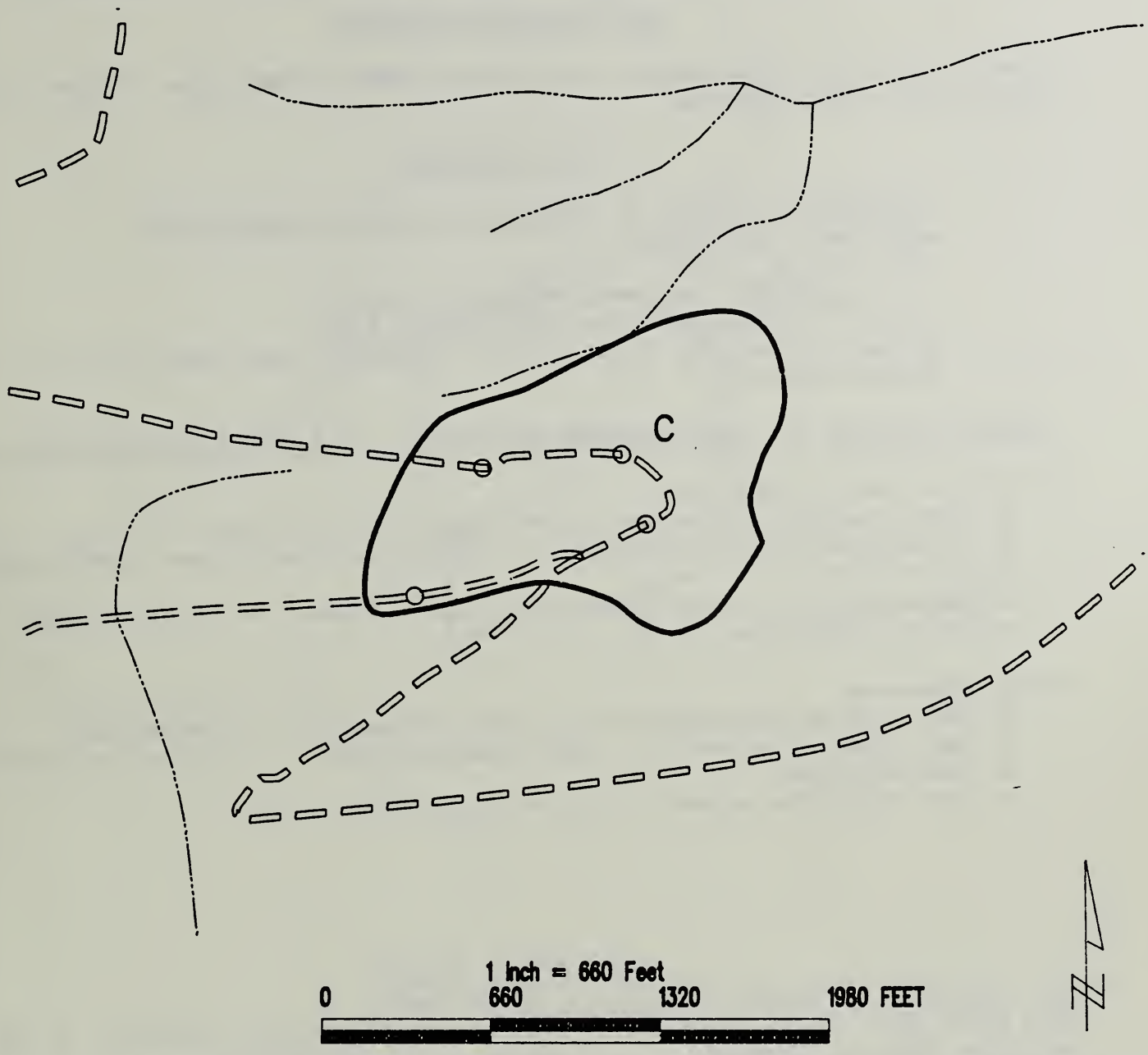
O: Need to maintain adequate travel corridors.

D: Leave minimum of 300' uncut corridors between northwest boundary and east boundary of Unit 508A.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/coversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x 16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-209 4-409 5-509 5A-509A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale· PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 31
Unit Number(s): 210 Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stands to even-aged. Shape unit to appear like a natural slide.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce, Alaska-cedar
Age Class: 200+ yrs
Unit Volume:
772 MBF Net Saw 828 MBF Saw/Util
Volume/Acre (net Sawlog): 25.0 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

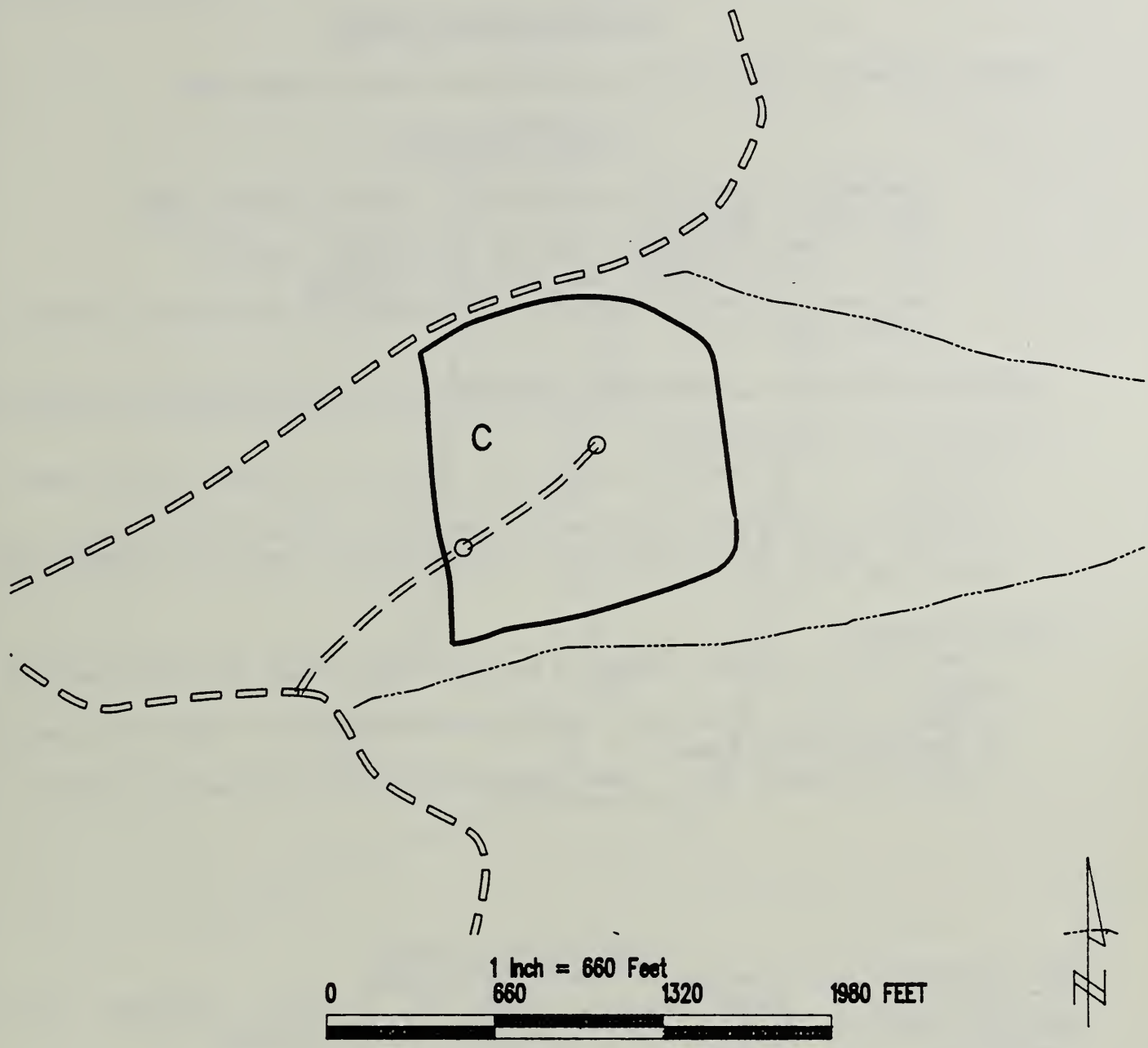
Soils/Water Quality/Fisheries
C: Water quality in V-notches above Class I fish habitat.
O: Minimize sideslope disturbance to reduce the risk of mass wasting (BMP 13.16 03 & 05).
D: Maintain a 150' uncut buffer to stream in V-notch on south-southeast boundary (BMP's 12.6, 13.2).

Visual Resources
C: Unit high on slope will be seen from Portage Bay in middleground
O: VQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "modification".
D: Unit should be shaped to appear like a natural slide.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A ; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs. CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2 - 210



	Unit Boundary		Stream - Class I
	Harvest System Boundary		Stream - Class II
	Existing Specified Road		Stream - Class III
	Existing Road - Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 77
Unit Number(s): 211 Harvest Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce, Alaska-cedar
Age Class: 200+ yrs
Unit Volume: 2,500 MBF Net Saw 2,774 MBF Saw/Util
Volume/Acre (net Sawlog): 32.0 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Stability of V-notches; possibility exists to increase risk of mass wasting.
O: Minimize disturbance of V-notch sideslopes (BMP 13.16 03 & 05).
D: Ensure south unit boundary is a minimum of 50' north of V-notch slope break (BMP 13.2).

Visual Resources
C: Unit high on slope, likely to be seen from Portage Bay and Frederick Sound.
O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "maximum modification".
D: Need to reshape unit. (Due to economics, the unit was not reshaped.)

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A ; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs. CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2 - 211

	Unit Boundary		Stream - Class I
	Harvest System Boundary		Stream - Class II
	Existing Specified Road		Stream - Class III
	Existing Road - Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 44
Unit Number(s): 410 Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Join backline boundary with alpine when possible.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce, Alaska-cedar
Age Class: 200+
Unit Volume: 1,021 MBF Net Saw 1,099 MBF Saw/Util
Volume/Acre (net Sawlog): 23.0 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Water quality in V-notches above Duncan Salt Chuck Creek.
O: Minimize sideslope disturbance to reduce the risk of mass wasting (BMP 13.16 03 & 05).
D: Maintain a 200' uncut zone from main V-notch channel on east boundary (BMP's 12.6, 13.2).

Visual Resources
C: Upper boundary may be seen from Portage Bay
O: IVQO = Modification. TLMP-recommended VQO's = "partial retention" to "maximum modification.
D: Recommend joining backline with alpine whenever possible.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged
SITE PREP: N/A ; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs. CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
4 – 410

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 76
Unit Number(s): 510, 510A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Tie upper boundary into open muskeg so they blend as much as possible. If this can't be done, timber receipts may be used to mitigate.

UNIT ATTRIBUTES

Predominant Species: W.hemlock, S. spruce, Alaska-cedar
Age Class: 200+
Unit Volume: 1,830 MBF Net Saw 1,966 MBF Saw/Util
Volume/Acre (net Sawlog): 24 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

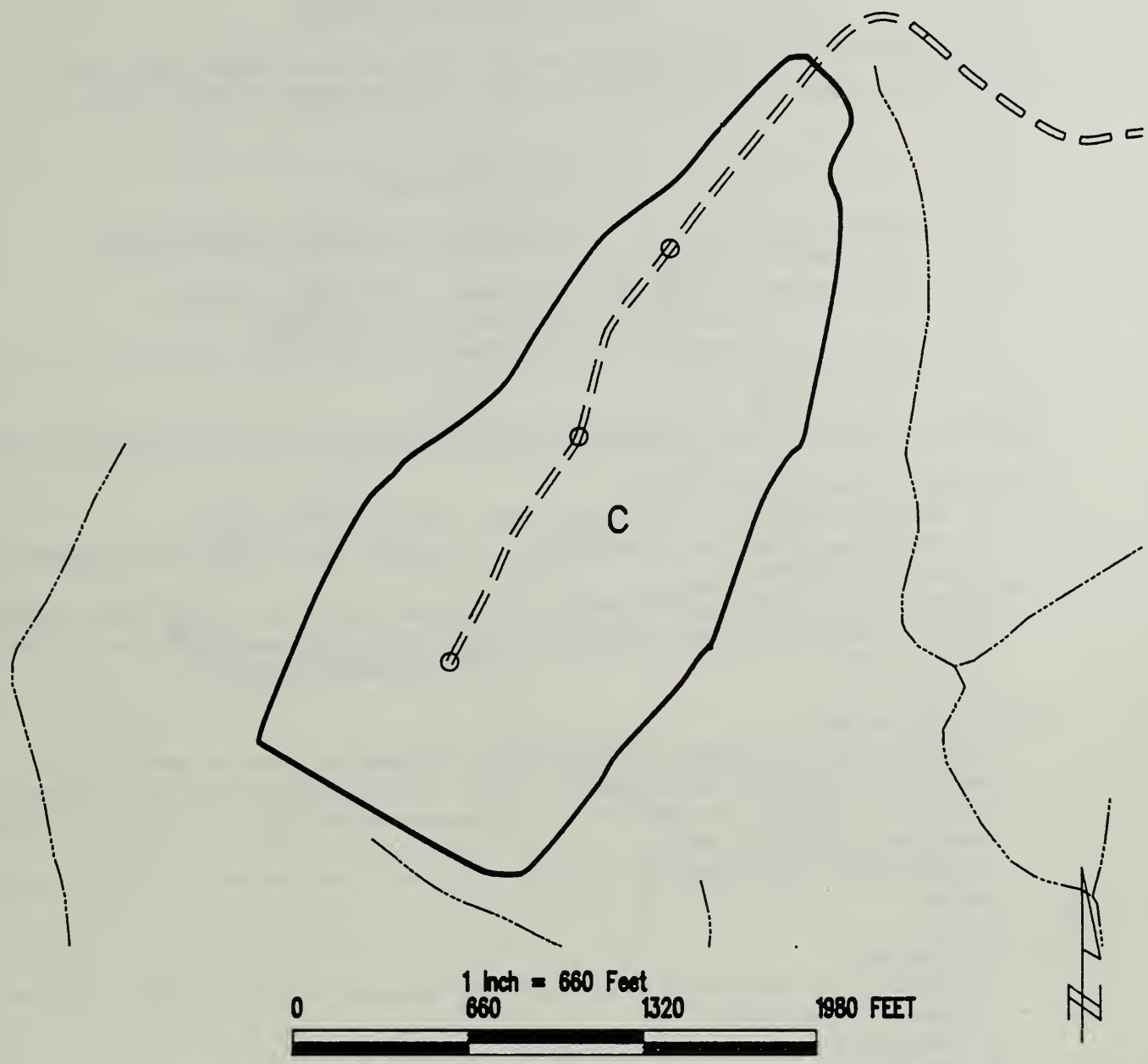
Soils/Water Quality/Fisheries
C: Water quality in V-notches above Duncan Salt Chuck Creek.
O: Minimize sideslope disturbance to reduce risk of mass wasting (BMP 13.16 03 & 05).
D: Maintain a 200' uncut zone from main V-notch channel on east boundary (BMP 12.6). Utilize V-notch as south-southwest boundary (BMP 13.2).

Visual Resources
C: Backline likely to be seen at an angle from Portage Bay. Cumulative effects of Units 510A, 511A, & 512A may be less than acceptable.
O: IVQO = Modification. TLMP-recommended VQO = "partial retention" to "maximim modifidation".
D: Join the uphill boundary line with the alpine muskeg opening.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
5-510 5A-510A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 61
Unit Number(s): 411, 511, 511A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting it to an even-aged stand. Visuals concerns were partially mitigated with dropping some of Unit 512A.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce, Alaska-cedar
Age Class: 200+
Unit Volume: 1,395 MBF Net Saw 1,503 MBF Saw/Util
Volume/Acre (net Sawlog): 23 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Siols/Water Quality/Fisheries
C: Water quality in V-notches above Class I fish habitat
O: Minimize sideslope disturbance to reduce the risk of mass wasting (BMP 13.16 03 & 05).
D: Maintain a 200' uncut buffer with manistem V-notch on west boundary (BMP 12.6). Utilize slope break of V-notch as south-southeast unit boundary (BMP 13.2).

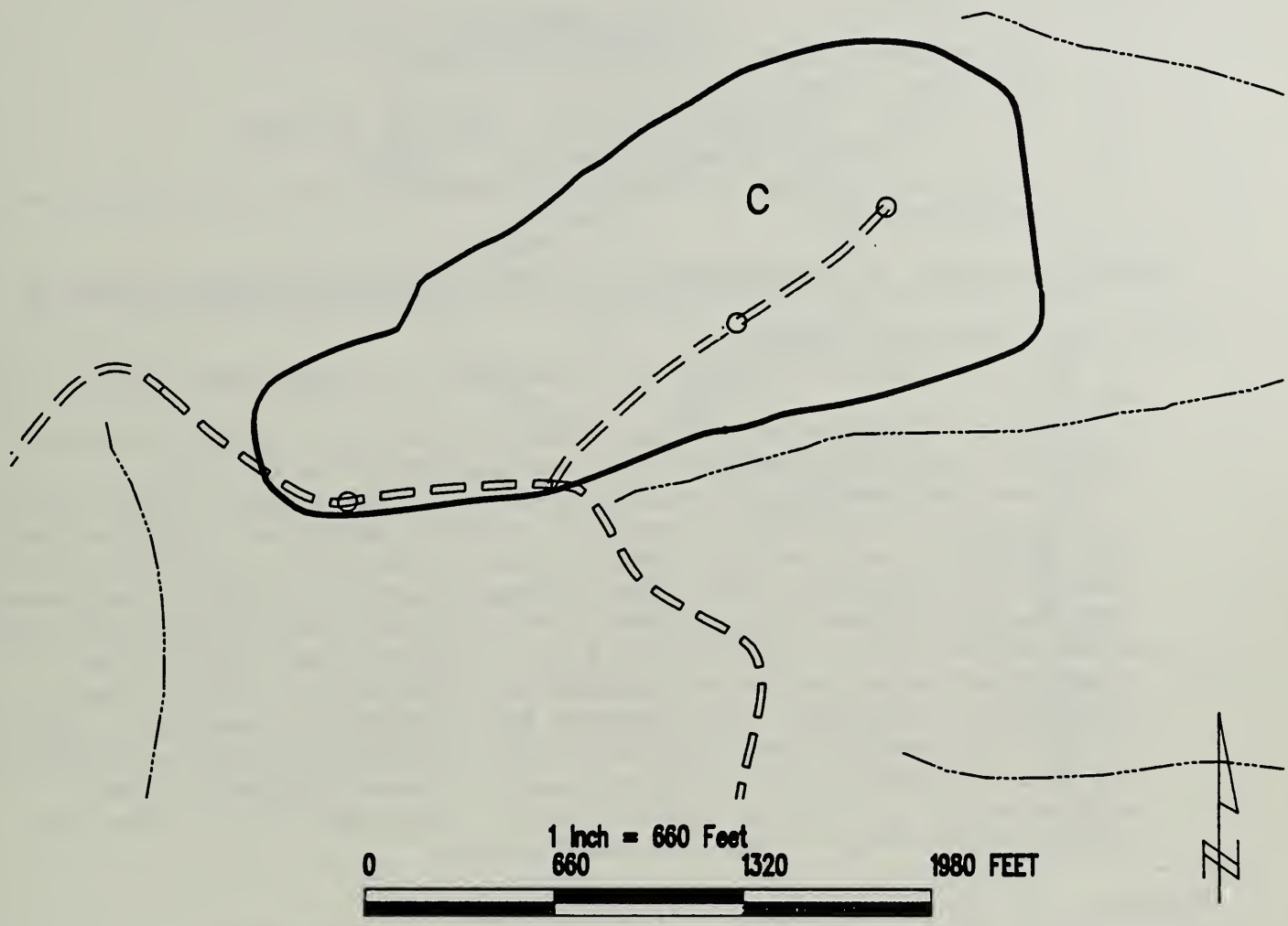
Visual Resources
C: Unit will be highly visible from Portage Bay due to position on slope. Cumulative impacts of Units 510, 511, & 512 may be less than acceptable.
O: IVQO = Partial Retention. TLMP-recommended VQO = "partial retention" to "maximum modification".
D: Recommend reducing the size of this unit or one of the other associated units.

Transportation
C: If unit is decreased substantially in size, cost per MBF will increase disproportionately.
O: Maintain economic viability.
D: Timber recommendation is to harvest entire unit as stated.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
4-411 5-511 5A-511A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 23
Unit Number(s): 412, 512, 512A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting to an even-aged stand. Interior setting was dropped, splitting unit in two to avoid a V-notch and the associated soil instability and negative impacts on visual resources. Northern portion of this unit was joined with southern portion of Unit 513A, which was also split in two. Unit boundary should be 50' upslope from the V-notch. Directional fell away from the channel.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 461 MBF Net Saw 501 MBF Saw/Util
Volume/Acre (net Sawlog): 20 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries

C: Slope stability of V-notch on nothern unit boundary above class I fish habitat

O: Minimize sideslope disturbance through reducing risk of windthrow in residual stand and subsequent mass wasting (BMP 13.16 O3 & O5).

D: Ground reconnaissance of existing second growth stands in the vicinity of this unit, which are the result of historic windthrow, indicate that most windthrow here results form wind out of the north. As this unit in leeward in a northerly storm, the residual stand is thought to be somewhat wind firm as planned. The northern unit boundary should follow the slope break of the V-notch (BMP 13.2 E8 & E10). As with unit 509, it is recommended where the yarding capability exists and the risk to soil disturbance is minimal, that dominate and co-dominant trees up to about 50' outside the boundary (near the top of the V-notch sideslope) be felled into the unit and yarded with an attempt made to leave intermediate and suppressed trees in place (BMP 13.2 E10). This should help reduce the destabilizing effect of wind on the sideslope.

Wildlife

C: Size of unit, loss of travel corridors.

O: Protect moderate to high pine marten habitat (HSI:>.7)

D: Maintain uncut 500' buffer between Units 512 A and 513A to the northeast.

Visual Resources

C: Unit will be seen from Portage Bay. Cumulative impacts of Units 510, 511, & 512 may be less than acceptable.

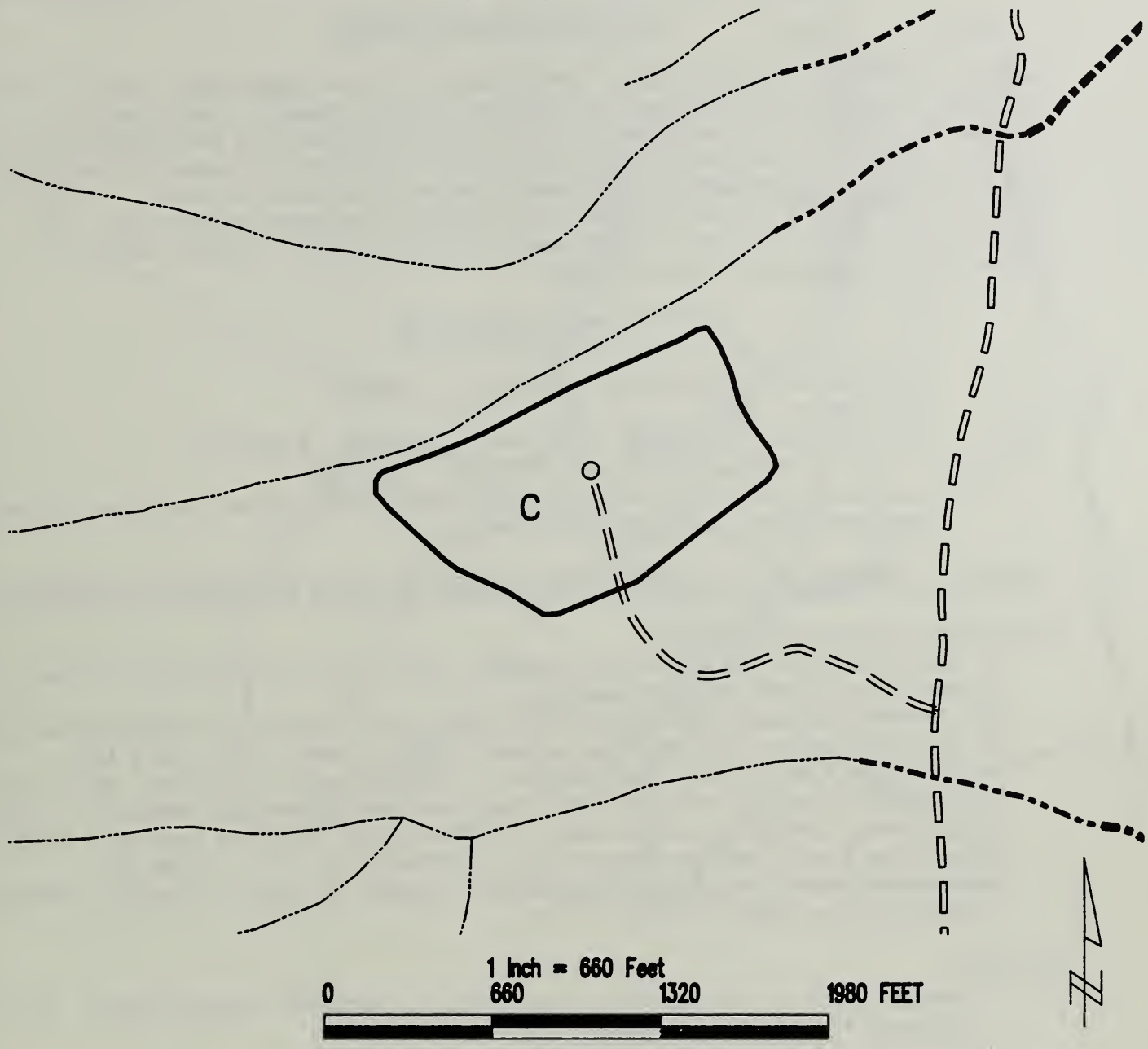
O: IVQO = Partial Retention. TLMP-recommended VQO = "partial retention" to "maximum modificaton".

D: Recommend splitting into series of smaller units with irregular boundaries.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
4-412 5-512 5A-512A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 73
Unit Number(s): 413, 513, 513A Harvesting Technique: high-lead, shovel

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting it to an even-aged stand. The southwest boundary is designed to mitigate visual impacts, adopting an irregular shape to the backline. A 100' uncut buffer will be maintained to protect the Class I stream in the north 1/4 of the unit. Area with multiple Class I streams (interior of unit) was dropped from present unit. A 100' uncut buffer on Class I stream defines the northern boundary of the unit. A fisheries biologist needs to be present during layout. Please notify in advance so arrangements can be made.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 1,770 MBF Net Saw 1,938 MBF Saw/Util
Volume/Acre (net Sawlog): 24 MBF
Recreation Setting: Harvest would change ROS class from Semi-Primitive Non-Motorized to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Bank stability of alluvial channels with high potential of lateral migration and loss of fish habitat.
O: Protect channel stability, minimizing disturbance of streambanks, and of alluvial soils with shallow organic layers (BMP 13.16, O3 & O5).
D: Maintain a 100' uncut buffer on all Class I and II streams (BMP 12.6). Splitline Class III streams where possible using partial suspension where splitlining cannot be completed. Utilize slope break as boundary along channel on south-southwestern corner (BMP's 13.2, 13.9, 13.16 E11). Recommened shovel yarding on northeast section of unit to protect shallow alluvial soils (BMP 13.7).

Wildlife
C: Loss of travel and security corridors to wetland muskeg habitat to east
O: Protect winter deer habitat.
D: Maintain at least 500' uncut buffer on old-growth between units 512A & 514A

Visual Resources
C: Backline of unit likely to be seen from Portage Bay.
O: IVQO = Partial Retention. TLMP-recommended VQO = "partial retention" to "maximum modification".
D: Recommend an irregular backline shape if possible.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
4-413 5-513 5A-513A

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 18
Unit Number(s): 413, 513, 513A north Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting it to an even-aged stand. A 100' buffer needs to be maintained along the south boundary to protect the Class I stream. A 100' uncut Class I stream defines the southern boundary. Unit site has been kept to a minimum and kept low in elevation profile. A fisheries biologist needs to be present during layout.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 373 MBF Net Saw 405 MBF Saw/Util
Volume/Acre (net Sawlog): 21 MBF

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Possible jeopardizing of anadromous and native fish habitat.
O: Protect anadromous fish habitat (BMP 13.16, 03).
D: Maintain a 100' uncut buffer on Class I on the southern boundary (BMP 12.6)

Visual Resources
C: There may be an impact on the view from Portage Bay & Frederick Sound.
O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "modification".
D: Minimize size and maintain low elevational profile.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
4-413N 5-513N 5A-513AN

	Unit Boundary		Stream - Class I
	Harvest System Boundary		Stream - Class II
	Existing Specified Road		Stream - Class III
	Existing Road - Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 59
Unit Number(s): 414, 514, 514A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Establish a 100' uncut timbered buffer along the Class II stream (running into Class I) on lower channel of the north unit boundary. Ensure that a 500' uncut old-growth strip is retained between Units 513A and 514A to mitigate wildlife concerns. Ten acres were dropped from the northwest corner of the unit to avoid the impact on the fish habitat. Three acres of the southwest corner were eliminated to create a less visually dominant unit shape. Maintain a 50-100' unmerchantable buffered boundary where possible to mitigate wildlife and visual concerns. A fisheries biologist needs to be present during layout.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, Alaska-cedar
Age Class: 200+
Unit Volume: 1,283 MBF Net Saw 1,386 MBF Saw/Util
Volume/Acre (net Sawlog): 22 MBF
Recreation Setting: Harvest would change ROS class from Semi-Primitive Non-Motorized to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Streambanks of small incised channel are unstable, and possible loss of fish habitat.
O: Minimize disturbance and sediment production from slopes and streambanks, and protect fish habitat (BMP 13.16 03 & 05).
D: Utilize channel as north-northwest unit boundary. Provide a 100' uncut buffer on all class I and II channels (BMP 12.6). On all Class III channels harvest to streambank while providing directional felling of timber (BMP's 13.2, 13.16, E11). Splitline where possible and partially suspend where splitlining is not possible (BMP's 13.9, 13.16 E11).

Wildlife
C: Travel/security corridors will be lost. The road system will increase fragmentation of the habitat.
O: Retain corridors between units.
D: Retain >500' uncut block between Units 513A North and 514A.

Visual Resources
C: Unit will be seen from Portage Bay and Frederick Sound; concern about the square shape of southwest unit boundary.
O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "modification".
D: Recommend backline boundary be diagonally oriented to the slope; lessen the "square" shape.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP

4-414 5-514 5A-514A

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 71
Unit Number(s): 415, 515, 515A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Establish 100' uncut, forested leave-strips adjacent to Class I and Class II (which flow into Class I) streams to mitigate fish habitat concerns. This, in turn, will satisfy the needs of wildlife. Deleted approximately 1 acre on northwest corner and 3 acres on south end to mitigate visuals, avoiding a square unit shape and creating a less visually dominant unit shape. Maintain a 50-100' unmerchantable buffer where possible to mitigate wildlife and visual concerns. A fisheries biologist needs to be present during layout.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, Alaska-cedar
Age Class: 200+
Unit Volume: 1,756 MBF Net Saw 1,883 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: Harvest would change ROS class from Semi-Primitive Non-Motorized to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries

C: Possible jeopardizing of sideslope stability and water quality above anadromous and native fish habitat.

O: Minimize disturbance and sediment production from slopes and streambanks protecting anadromous and native fish habitat, e.g. water temp, large organic debris (LOD) (BMP 13.16 03 & 05).

D: Utilize channels as unit boundaries on northeast and extreme north sides (BMP 13.2). On northeast boundary a 100' uncut buffer is required (BMP 12.6). On the north boundary a 100' uncut buffer is required, but boundary is recommended to be at least 50' upslope of slope break to ravine (BMP's 12.6; 13.2). A 100' uncut buffer is required on all Class I and II streams (BMP 12.6). Splitlining or partial suspension is required on all Class III streams (BMP 13.9; 13.16, E11).

Wildlife

C: Structural stand diversity would be lost.

O: Maintain wildlife habitat/diversity.

D: Retain some green trees in strips for travel corridors/thermal cover.

Visual Resources

C: Unit would be seen from Portage Bay & Frederick Sound. Particular concern lies with view from Portage Bay anchorages.

O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "modification".

D: Recommend irregularly-shaped southwest unit boundary.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
4-415 5-515 5A-515A

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 70
Unit Number(s): 416, 516, 516A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Approximately two acres along the south boundary were deleted to mitigate visual concerns, avoiding a square unit shape and a less visually dominant unit boundary. Maintain a 50-100' unmerchantable buffer where possible along the boundary to mitigate wildlife and visual concenrs.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce, Alaska-cedar
Age Class: 200+
Unit Volume: 1,259 MBF Net Saw 1,378 MBF Saw/Util
Volume/Acre (net Sawlog): 18 MBF
Recreation Setting: Harvest would change ROS class from Semi-Primitive Non-Motorized To Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

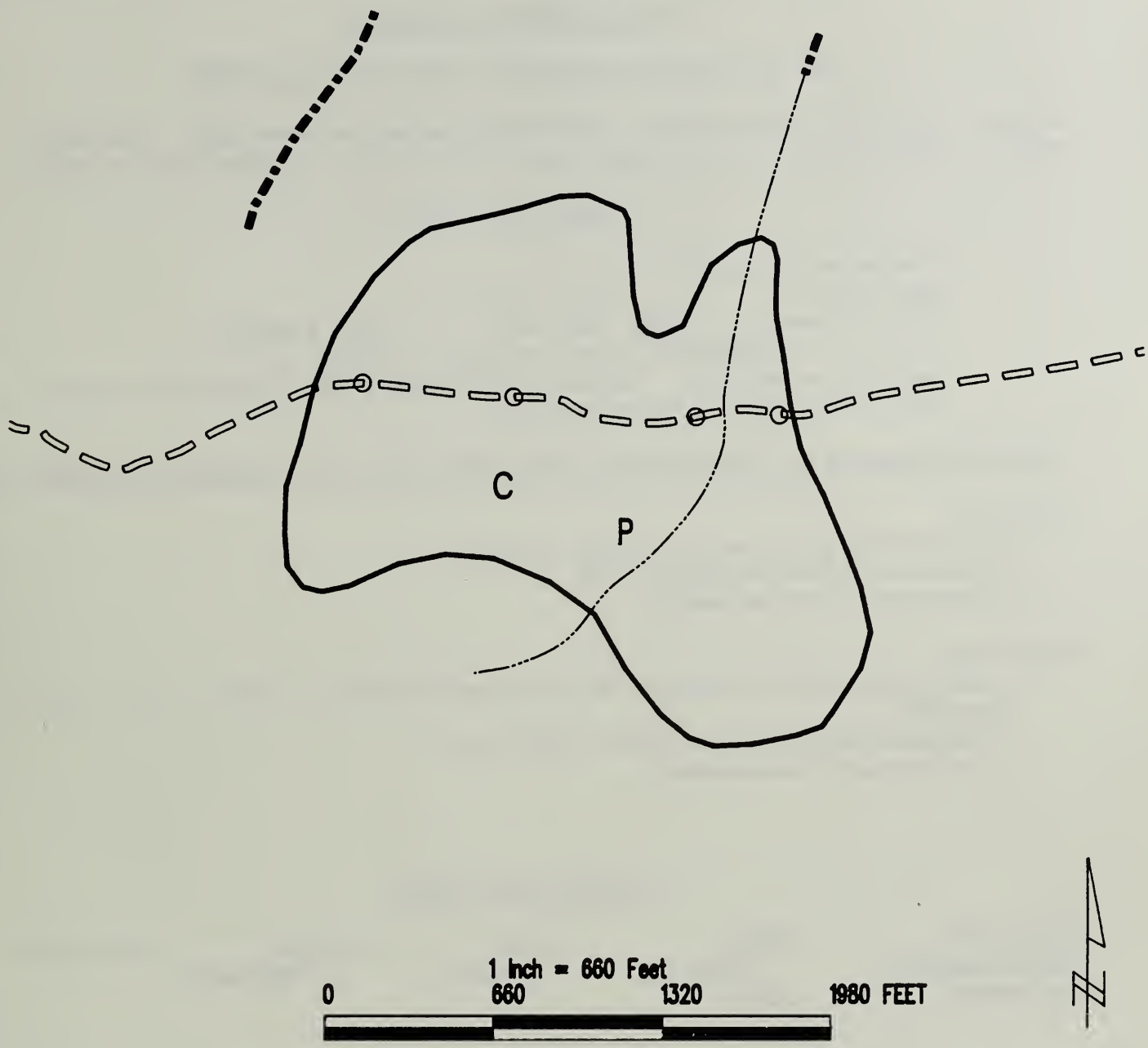
Soils/Water Quality/Fisheries
C: Maintain integrity of small channel.
O: Minimize disturbance of streambanks (BMP 13.16 03 & 05).
D: Either splitline settings or partially suspend logs as appropriate (BMPs 13.9; 13.16, E11).

Visual Resources
C: The south boundary of the proposed unit will be visible from a large area of Frederick Sound.
O: IVQO - Partial Retention. TLMP-recommended VQO's - "partial retention" to "modification".
D: Shape the south unit boundary to blend with landscape. Timber receipts may be used to remove ridgetop trees giving the unit a more smoother appearance if the contract cannot accomplish this.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
4-416 5-516 5A-516A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale·PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 16
Unit Number(s): 417, 517, 517A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

DUE TO NONMERCHANTABILITY THIS UNIT IS DROPPED.

Harvest timber for regeneration, converting stand to even-aged. Possibly develop rock pit at base of slope, east of the unit, outside the boundary.

UNIT ATTRIBUTES

Predominant Species: _____
Age Class: _____
Unit Volume: _____ MBF Net Saw _____ MBF Saw/Util
Volume/Acre (net Sawlog): _____ MBF
Recreation Setting: Harvest would change ROS from Semi-Primitive Non-Motorized to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Wildlife
C: Vancouver goose nest located in unit
O: Protect Vancouver goose nest.
D: Recommend not harvesting.

Vegetation
C: This has been determined to be non-merchantable timber in this unit (non-CFL).
O: Convert merchantable timber lands only
D: No harvest recommended.

PRESCRIPTION SUMMARY

OBJ:
SITE PREP: ; REGEN: ; THIN: ; SPACING: ; ROTATION:
INSECT/DISEASE: ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 68
Unit Number(s): 419, 519, 519A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Ensure that a 500' uncut old-growth strip is retained between Units 519A and 520A to establish a travel corridor for wildlife from the alpine areas to the Frederick Sound beach fringe. Leave all trees in the V-notch on the east unit boundary and directional fell timber away from this V-notch; this will help maintain sideslope integrity. North and west boundaries were modified creating a less visually dominant unit boundary.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce, Alaska-cedar
Age Class: 200+
Unit Volume: 1,693 MBF Net Saw 1,816 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: Harvest would change ROS class from Primitive to Roaded Modified or Semi-Primitive Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Unstable V-notch sideslopes.
O: Prevent disturbance of sideslopes (BMP 13.16, 03 & 05).
D: Layout east and boundary 50' upslope of V-notch slope break (BMP 13.2). South unit boundary should also be 50' upslope of slope break on tributary V-notch and landslide area. Directional felling of trees away from channel (BMP 13.16 E10).

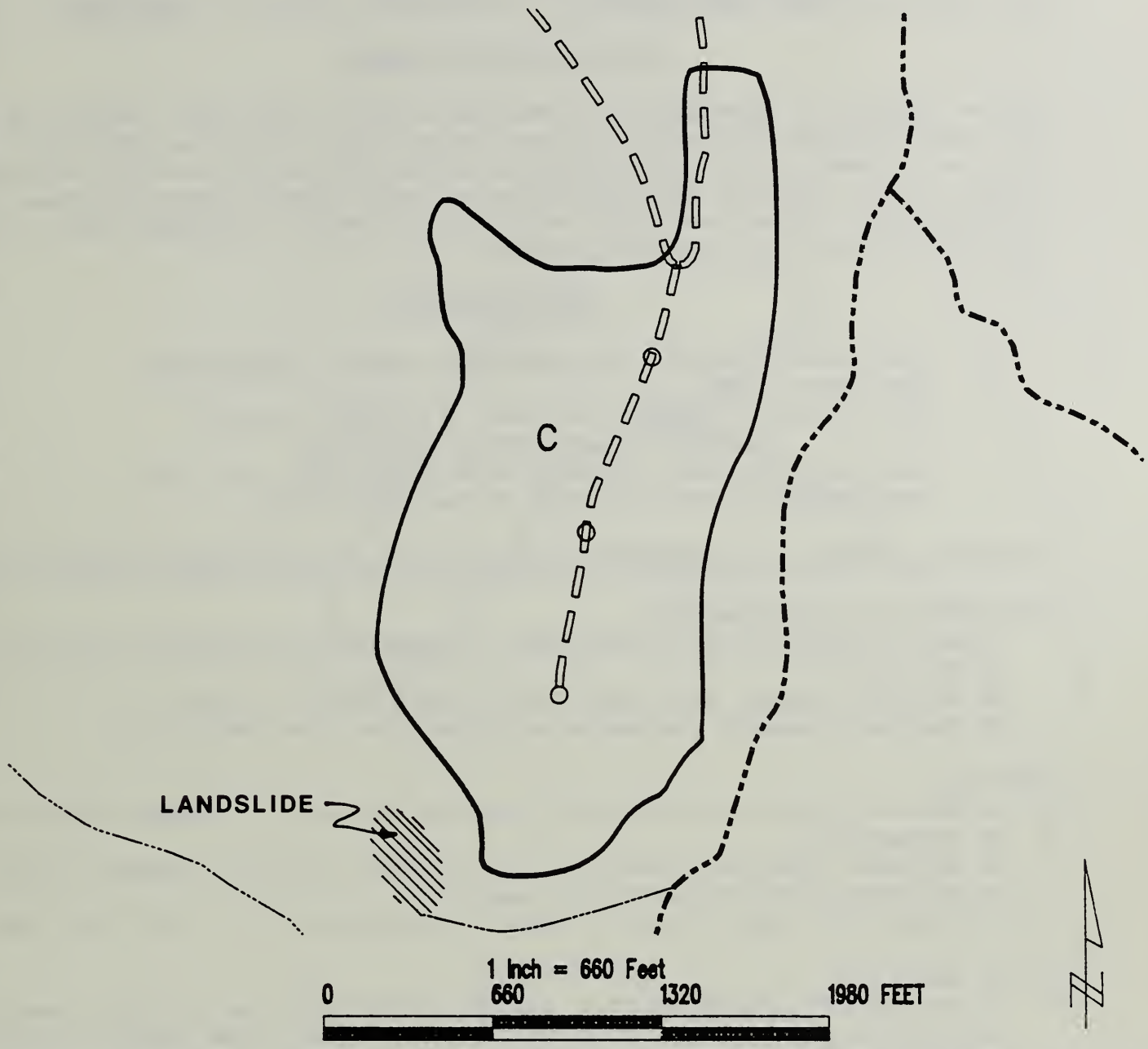
Wildlife
C: Travel corridors in area may be jeopardized.
O: Maintain travel corridors for wildlife.
D: Leave ≥500' uncut forested block between Units 519A, 517A, and 520A. This area is a saddle that provides natural travel routes.

Visual Resources
C: Unit will be seen from Frederick Sound. Blocky unit shape will give a stark appearance.
O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "modification".
D: Recommend reshaping western and northern boundary to modify the square shape.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
4-419 5-519 5A-519A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 424 Acres: 29
Unit Number(s): 420, 520, 520A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Ensure that a 500' uncut old-growth strip is retained between Units 519A, and 520A; this will serve as a travel corridor for wildlife between the alpine area and the beach fringe habitat. Require partial suspension while skidding above the road to protect soils. Fifty-three acres were dropped from the southeast side of the unit to blend the unit with the landscape.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce, Alaska-cedar
Age Class: 200+
Unit Volume: 722 MBF Net Saw 774 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: Harvest would change ROS class from Semi-Primitive Non-Motorized to Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Soil stability will be decreased, consequently increasing landslide probability.
O: Minimize mineral soil disturbance (BMP's 13.2 E4, 13.5).
D: Implement partial suspension on slope above road (BMP 13.9).

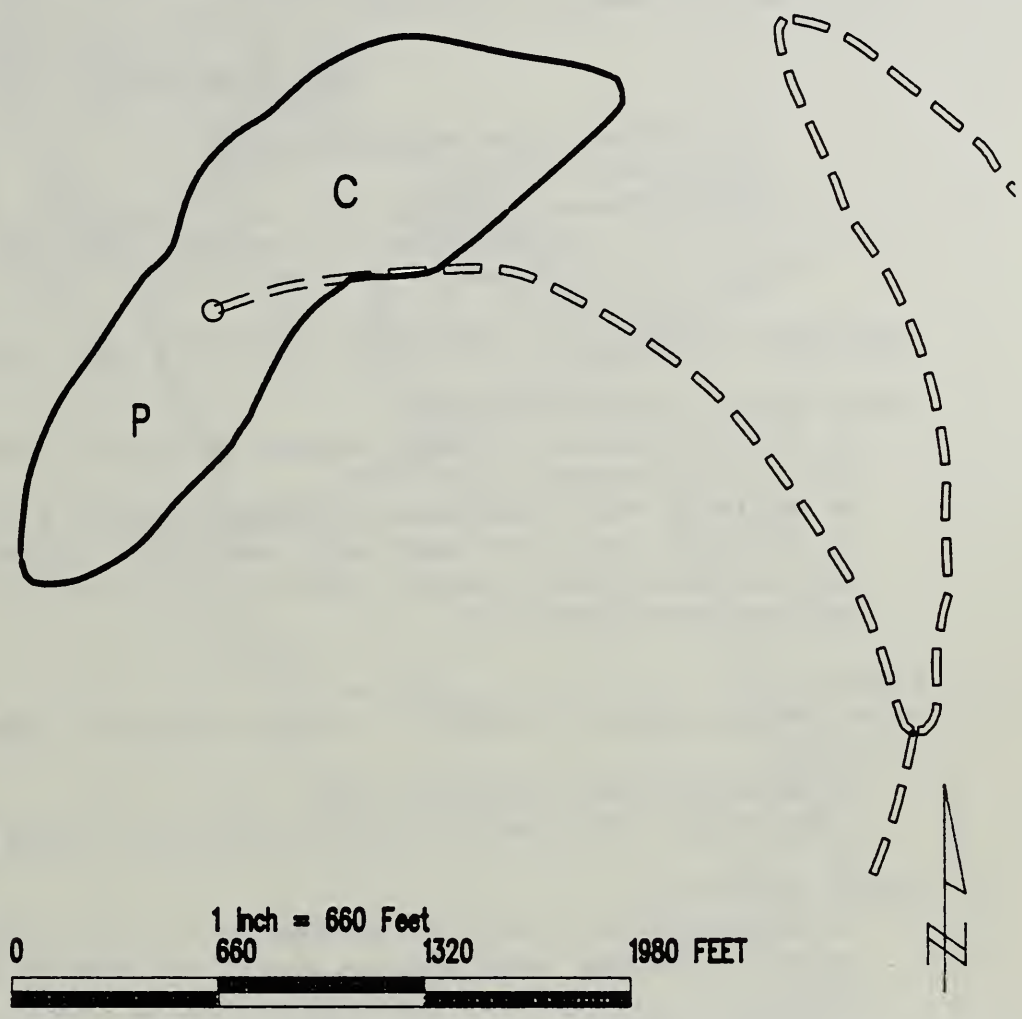
Wildlife
C: Natural travel corridor to the east of the unit in the main saddle may be jeopardized.
O: Maintain important travel corridor between the alpine habitat and the beach fringe habitat (Frederick Sound).
D: Leave ≥500' uncut block in saddle between Units 517A, 519A, and 520A.

Visual Resources
C: Unit will be highly visible from Frederick Sound due to high elevation. Leave strip between Units 520A and 519A may detract from visual quality.
O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "modification".
D: Shape unit to keep the bulk of the unit inside the concave face of the slope, softening the visibility from an angle; simulate the appearance of a fan-shaped slide.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
4-420 5-520 5A-520A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 19
Unit Number(s): 212, 301, 521, 521A Harvesting Technique: shovel

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, creating even-aged stand. Recommend shovel-yarding, leaving unmerchantable trees where possible in a 50 - 100' buffered boundary along existing managed stand boundaries to mitigate wildlife and visual concerns. A wildlife biologist needs to work with a silviculturist and layout crew during layout.

UNIT ATTRIBUTES

Predominant Species: W. hemlock
Age Class: 200+
Unit Volume: 473 MBF Net Saw 507 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: No change to ROS class - stays Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Possible jeopardizing of channel stability, and mineral soil disturbance due to thin organic layer.
O: Minimize soil disturbance of channel (BMP 13.16 03 & 05).
D: Utilize channel as south unit boundary. Ok to harvest to streambank, but minimize debris loading (BMP's 13.2, 13.16 E5). Recommend shovel yarding unit (BMP 13.7).

Wildlife
C: There will be a loss of a thermal cover for snow intercept for wintering deer
O: Maintain deer winter habitat.
D: Maintain a minimum of a 500' uncut strip along the north boundary

Visual Resources
C: Unit would be seen from Portage Bay at log transfer facility. Unit would create one large opening out of sortyard & two existing adjacent units.
O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "maximum modification".
D: Partial harvesting some of the unit would help to visually break up the large opening. (Due to the high risk of blowndown partial harvesting is not recommended for this unit.)

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-212 3-301 5-521 5A-521A

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 43
Unit Number(s): 213, 302, 522, 522A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Maintain an uneven-aged 50 - 100' strip along the eastern unit boundary (complements the logging logistics) to mitigate visuals and wildlife; unmerchantable trees within this buffer will be retained where possible. Ensure that a 500' uncut old-growth buffer is retained between Units 522A & 521A. Ensure that a diagonal unit boundary is maintained across the eastern side to mitigate visuals concerns.

UNIT ATTRIBUTES

Predominant Species: W. hemlock
Age Class: 200+
Unit Volume: 1,071 MBF Net Saw 1,148 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: No change to ROS class - stays Roaded Modified

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Siols/Water Quality/Fisheries
C: V-notch instability may be a concern in class III channels.
O: Minimize disturbance to side slopes (BMP 13.16 O3 & O5).
D: Where channels exist on unit boundaries limit harvest to ravine slope breaks and avoid debris laoding of channels (BMP's 13.2; 13.16, E5). Either splitline on or partial suspend across channel bisecting unit (BMP's 13.9; 13.16, E11). Designate landings such that yarding up streamcourses is avoided in these narrow or angular settings (BMP 13.10).

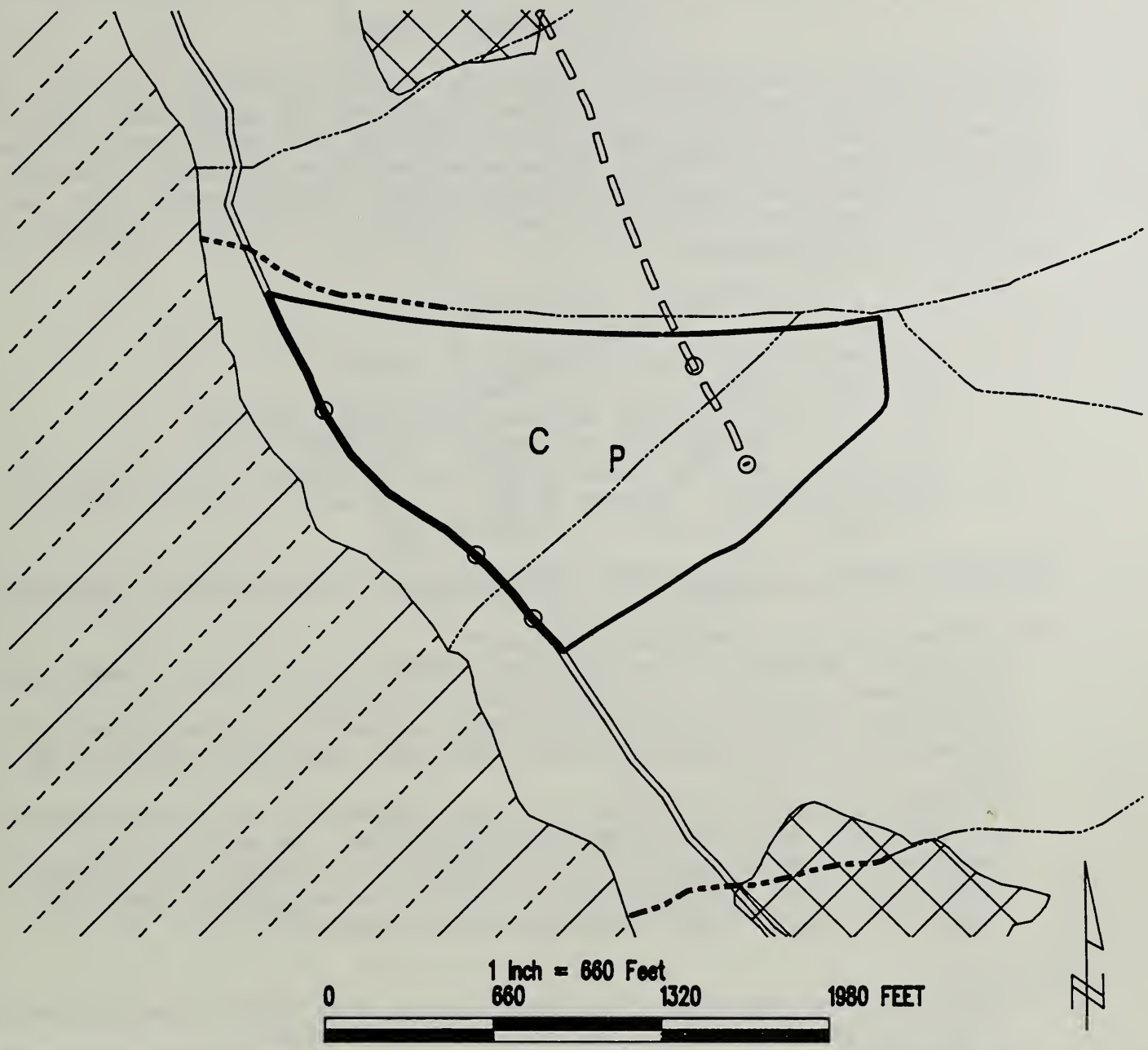
Wildlife
C: Loss of wintering deer travel habitat may occur.
O: Provide wind-firm travel corridors on north and south unit boundaries.
D: Retain ≤ 500' uncut old-growth travel corridor and thermal cover area between Units 521A & 522A. Provide some in-stand diversity by leaving some green trees in the stand.

Visual Resources
C: Unit would be seen from Portage Bay.
O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "maximum modification".
D: Recommend angular, pointed eastern boundary rather than squared-off, boxy shape.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to evenaged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-213 3-302 5-522 5A-522A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 34
Unit Number(s): 214, 303, 523, 523A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Retain a 500' uncut timbered strip adjacent to the north side and the south side of the unit for deer travel corridors. Ensure that a diagonal unit cut boundary across the eastern boundary and a downhill dip as shown in the map included to mitigate visuals. Maintain an uneven-aged, unmerchantable, 50-100' strip along the eastern unit boundary to mitigate visual concerns. A wildlife biologist needs to be present during layout.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 847 MBF Net Saw 908 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: Most of the unit is already in ROS class of Roaded Modified. Eastern portion is currently in Semi-Primitive Motorized. Little if any change to ROS.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Largely ephemeral or intermittent channels may be hard to locate during unit layout, possibly limiting channel protection.
O: Get unit layout as close to unit map as possible, while minimizing disturbance of identifable channel banks and sideslopes (BMP 13.16 03 & 05).
D: Utilize locatable channels in the approximate vicinity of the mapped unit boundary to be the north and south boundary, or else utilize brush/second growth area on north boundary and estimate south boundary as mapped (BMP 13.2). Recommend split line on or partially suspend logs across the channel which bisects the unit (BMPs 13.9; 13.16, E11).

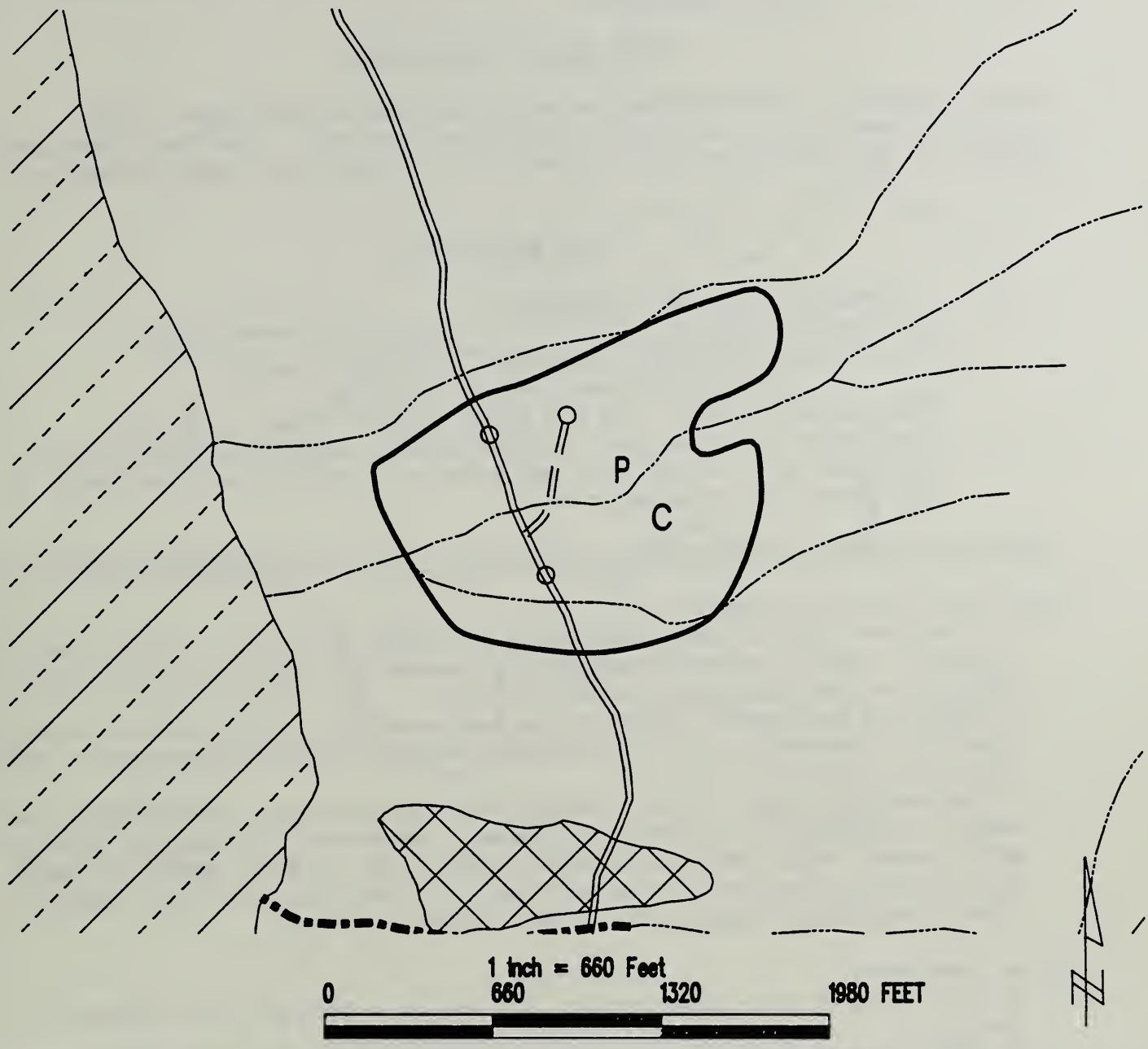
Wildlife
C: Further fragmentation of the deer habitat will occur. Heavily-used deer trail through the unit will be impacted significantly.
O: Maintain travel corridors.
D: Leave uncut old-growth strip adjacent to the north and south boundaries of unit.

Visual Resources
C: Unit will be seen from Portage Bay.
O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "maximum modification".
D: Create irregular shape when delineating unit boundaries on the east.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-214 3-303 5-523 5A-523A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 87
Unit Number(s): 215, 304, 524, 524A, 525A, 526A, 527A Harvesting Technique: helicopter

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Unit boundaries need to be irregularly shaped (not squared). Use the slope break boundary on the southwest side of the unit to screen unit from Portage Bay.

UNIT ATTRIBUTES

Predominant Species: W. hemlock
Age Class: 200+
Unit Volume: 3,479 MBF Net Saw 3,935 MBF Saw/Util
Volume/Acre (net Sawlog): 40 MBF
Recreation Setting: The ROS class is most likely to remain Semi-Primitive Motorized. A spectacular cascade/waterfall on the southwest side of the unit may provide a recreation opportunity for a trail from the existing road.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries

C: Increased risk of mass wasting in V-notches and other incised class III channels. North aspect slope appears frequently dissected with channels - the two largest are drawn on the unit map.

O: Minimize management influence on mass wasting risk by reducing debris loading of channels and by minimizing V-notch sideslope disturbauce (BMP's 13.5, 13.6 03 & 05).

D: Helicopter logging helps mitigate/minimize sidealpoe disturbance, but makes is difficult to clean out streams. Recommend directional felling on all channels with bankfull width of about 8 ft. or more (BMP13.16, E10). This should encourage bucking and limbing to be done away from channel -thus minimizing logging slash contributed to channel.

Visual Resources

C: Unit will be seen from Portage Bay and at a distance from Frederick Sound.

O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "maximum modification".

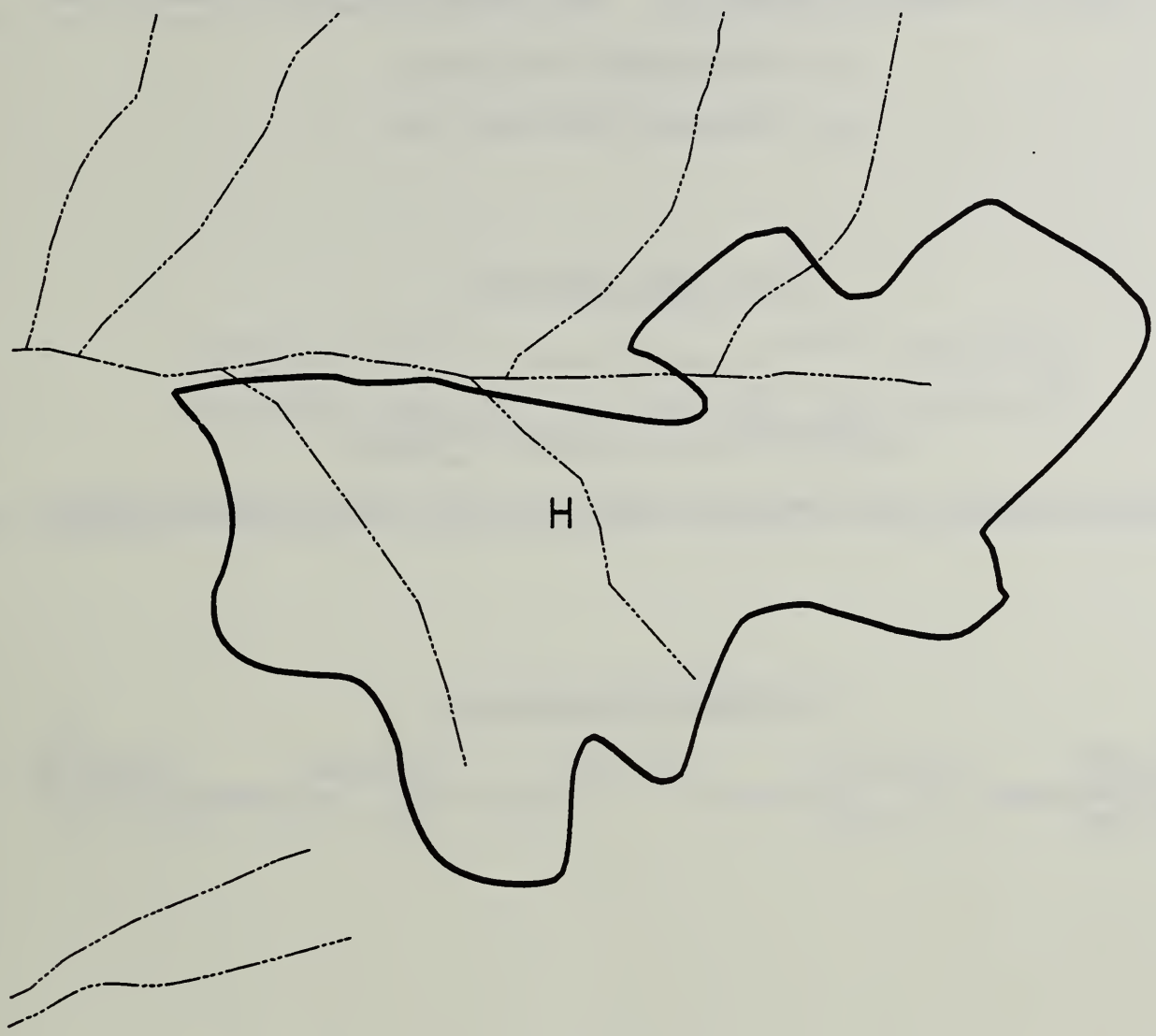
D: Create irregularly-shaped unit boundaries.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP

2-215 3-304 5-524 5A-524A



1 inch = 660 Feet

0 660 1320 1980 FEET

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: ____ LUD: __ VCU: ____ Acres: ___
Unit Number(s): 216, 305, 525A Harvesting Technique: _____

UNIT OBJECTIVES SUMMARY

COMBINED WITH UNIT 524A

UNIT ATTRIBUTES

Predominant Species: _____
Age Class: _____
Unit Volume: _____ MBF Net Saw _____ MBF Saw/Util
Volume/Acre (net Sawlog): ____ MBF

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

PRESCRIPTION SUMMARY

OBJ:
SITE PREP: ; REGEN: ; THIN: ; SPACING: ; ROTATION:
INSECT/DISEASE: ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: ____ LUD: __ VCU: ____ Acres: ___
Unit Number(s): 217, 306, 526, 526A Harvesting Technique: _____

UNIT OBJECTIVES SUMMARY

COMBINED WITH UNIT 524A

UNIT ATTRIBUTES

Predominant Species: _____
Age Class: _____
Unit Volume: _____ MBF Net Saw _____ MBF Saw/Util
Volume/Acre (net Sawlog): ____ MBF

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

PRESCRIPTION SUMMARY

OBJ:
SITE PREP: ; REGEN: ; THIN: ; SPACING: ; ROTATION:
INSECT/DISEASE: ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: ____ LUD: __ VCU: ____ Acres: ___
Unit Number(s): 218, 307, 527, 527A Harveting Technique: _____

UNIT OBJECTIVES SUMMARY

COMBINED WITH UNIT 524A

UNIT ATTRIBUTES

Predominant Species: _____
Age Class: _____
Unit Volume: _____ MBF Net Saw _____ MBF Saw/Util
Volume/Acre (net Sawlog): ____ MBF

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

PRESCRIPTION SUMMARY

OBJ:
SITE PREP: ; REGEN: ; THIN: ; SPACING: ; ROTATION:
INSECT/DISEASE: ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

Appendix F

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 19
Unit Number(s): 219, 308, 528, 528A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting the stand to even-aged. Directional fell trees away from stream to maintain stream stability and water quality. Maintain an uneven-aged, unmerchantable, 50 - 100' strip along the northern unit boundary to mitigate wildlife concerns. Ensure a diagonal northeastern cutting boundary to avoid a square visually dominant unit shape.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 473 MBF Net Saw 507 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: ROS class remains Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries

C: Unacceptable soil disturbance may occur on unstable sideslopes of the Class III channels causing degradation and increasing the risk of mass wasting.

O: Reduce sediment and other pollutants; maintain channel stability and integrity (BMP 13.16 O3 & O5).

D: Utilize channels as unit boundaries as mapped (BMP 13.2). Directional felling of timber into unit recommended (BMP 13.16, E10). Locate landing such that the risk of yarding logs down stream course is minimized (BMP's 13.10, 13.16 E11). Avoid debris loading in channels (13.16, E5).

Wildlife

C: Fragmentation and windthrow of old-growth habitat may occur, reducing high value pine marten and deer habitat (HSI: >.8).

O: Maintain travel corridors; minimize windthrow.

D: Provide some in-stand diversity by leaving some green trees along the nouthern boundary.

Visual Resources

C: Unit will be seen from Portage Bay.

O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "maximum modification".

D: Lay out the back unit boundary on a diagonal rather than perpendicular to the slope.

Recreation

C: Harvest activities will have an impact on the recreational experience of the Portage Bay Cabin users (cabin <1/4 mile from proposed harvest unit).

O: Minimize impact to Portage Bay Cabin users.

D: Harvest unit during low cabin use period. (Check with Recreation Forester.) Advise users in advance of harvesting activity.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-219 3-308 5-528 5A-528A

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 20
Unit Number(s): 220, 309, 529, 529A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Maintain an uneven-aged, unmerchantable, 50 - 100' strip along the unit northwest boundary to mitigate wildlife concerns, and a 500' uncut beach fringe. Wildlife biologist needs to be present during layout.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 498 MBF Net Saw 534 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: No change to ROS class - remains Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

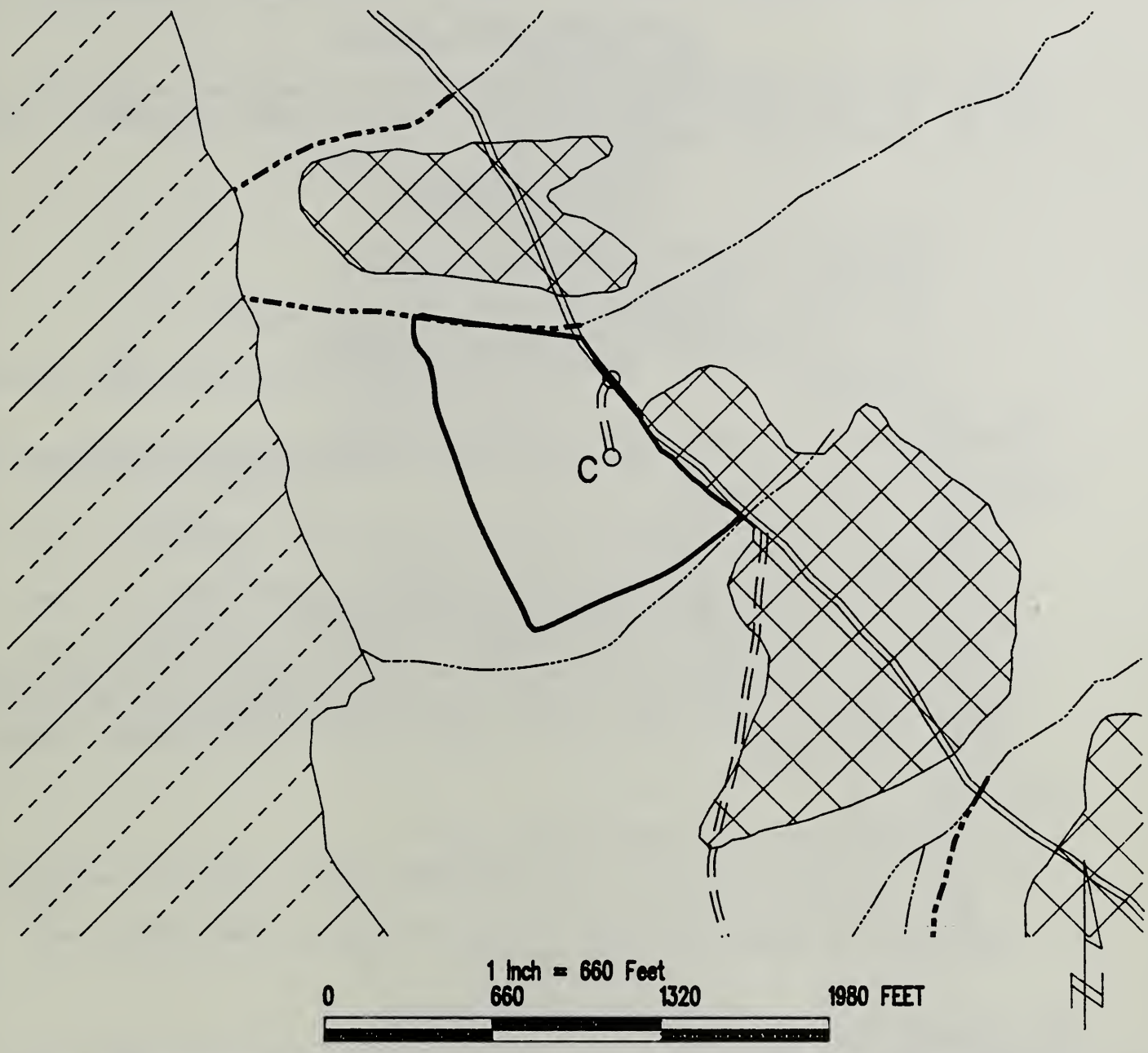
Soils/Water Quality/Fisheries
C: Footslope channels may be prone to degradation and headcutting (toward and thru road prism) if disturbed.
O: Minimize disturbance to streambanks (BMP 13.16 O3 & O5).
D: Utilize streambanks as boundaries, but directionally fell trees into unit while leaving sub-merchantable timber and any alder standing in tact (BMP 13.16, E10, E12). Avoid debris loading channels (BMP 13.16, E5).

Wildlife
C: High value winter deer and pine marten habitat (HSI: .8 & .9 respectively) will be lost.
O: Maintain beach fringe habitat, prevent windthrow, ensure travel corridors are maintained.
D: Leave > 200' uncut forested strip between proposed unit and existing unit on northwest boundary. Look for windfirm trees for south boundary.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-220 3-309 5-529 5A-529A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 47
Unit Number(s): 221, 310, 530, 530A Harvesting Technique: helicopter

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, coverting stand to even-aged, using helicopter yarding. Create irregular unit boundaries to avoid square appearance. This unit was combined with former Unit 531A.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 1,784 MBF Net Saw 2,027 MBF Saw/Util
Volume/Acre (net Sawlog): 38 MBF
Recreation Setting: ROS class would most likely remain Semi-Primitive Motorized.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

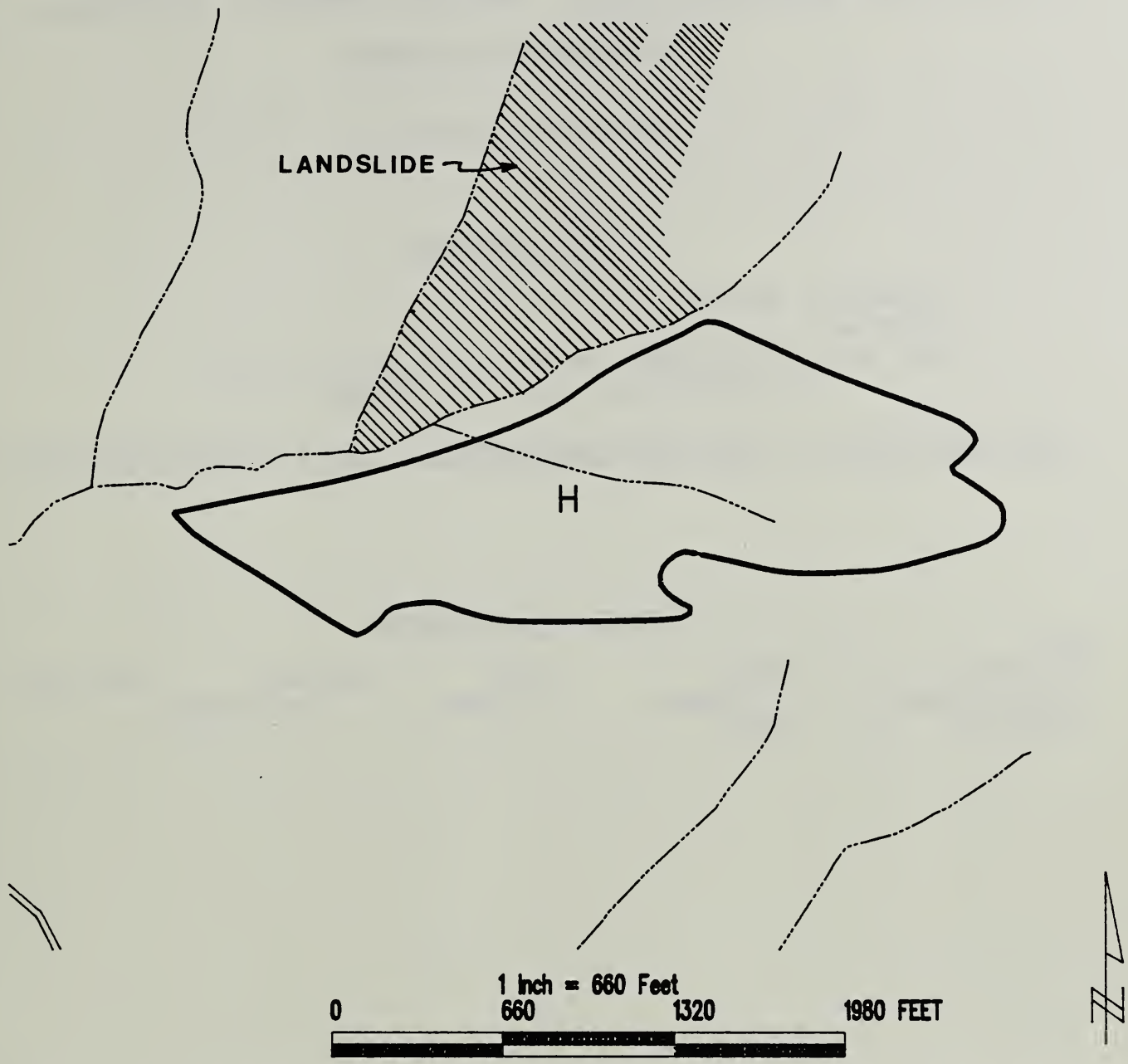
Soils/Water Quality/Fisheries
C: Timber harvest along banks of channel which may be degraded due to historic mass wasting event on opposite slope.
O: Maintain streambank stability, especially in those local areas where colluvium dominates bank control between bedrock nick points.
D: Helicopter yarding will help mitigate concerns. Directionally fell timber away from channel to encourage bucking and limbing out of the reach of high flows. Avoid debris loading the mainstream channel on the north boundary (BMP 13.16, E5, E10, E12). Leave as much submerchantable timber standing as possible.

Visual Resources
C: Unit will be visible from Portage Bay.
O: IVQO = Partial Retention. TLMP-recommened VQO's = "partial retention" to "maximum modification".
D: Make unit boundary irregular in outline to appear more natural in appearance upon recovering from harvest.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-221 3-310 5-530 5A-530A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: ___
Unit Number(s): 222, 311, 531, 531A Harvesting Technique: helicopter

UNIT OBJECTIVES SUMMARY

COMBINED WITH UNIT 530A

UNIT ATTRIBUTES

Predominant Species: _____
Age Class: _____
Unit Volume: _____ MBF Net Saw _____ MBF Saw/Util
Volume/Acre (net Sawlog): ____ MBF

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

PRESCRIPTION SUMMARY

OBJ:
SITE PREP: ; REGEN: ; THIN: ; SPACING: ; ROTATION:
INSECT/DISEASE: ; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

Appendix F

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 20
Unit Number(s): 223, 312, 532, 532A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Maintain a 100' buffer on Class II streams flowing into Class I streams on east side of unit. Maintain a 500' uncut beach finge along west boundary of unit. A wildlife biologist needs to be present during layout.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 498 MBF Net Saw 534 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: No change to ROS class - remains Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Siols/Water Quality/Fisheries

C: Stability of channels crossing the high gradient alluvial/colluvial fan landform, and the possible jeopardizing of anadromous and native fish habitat in Class I and II streams.

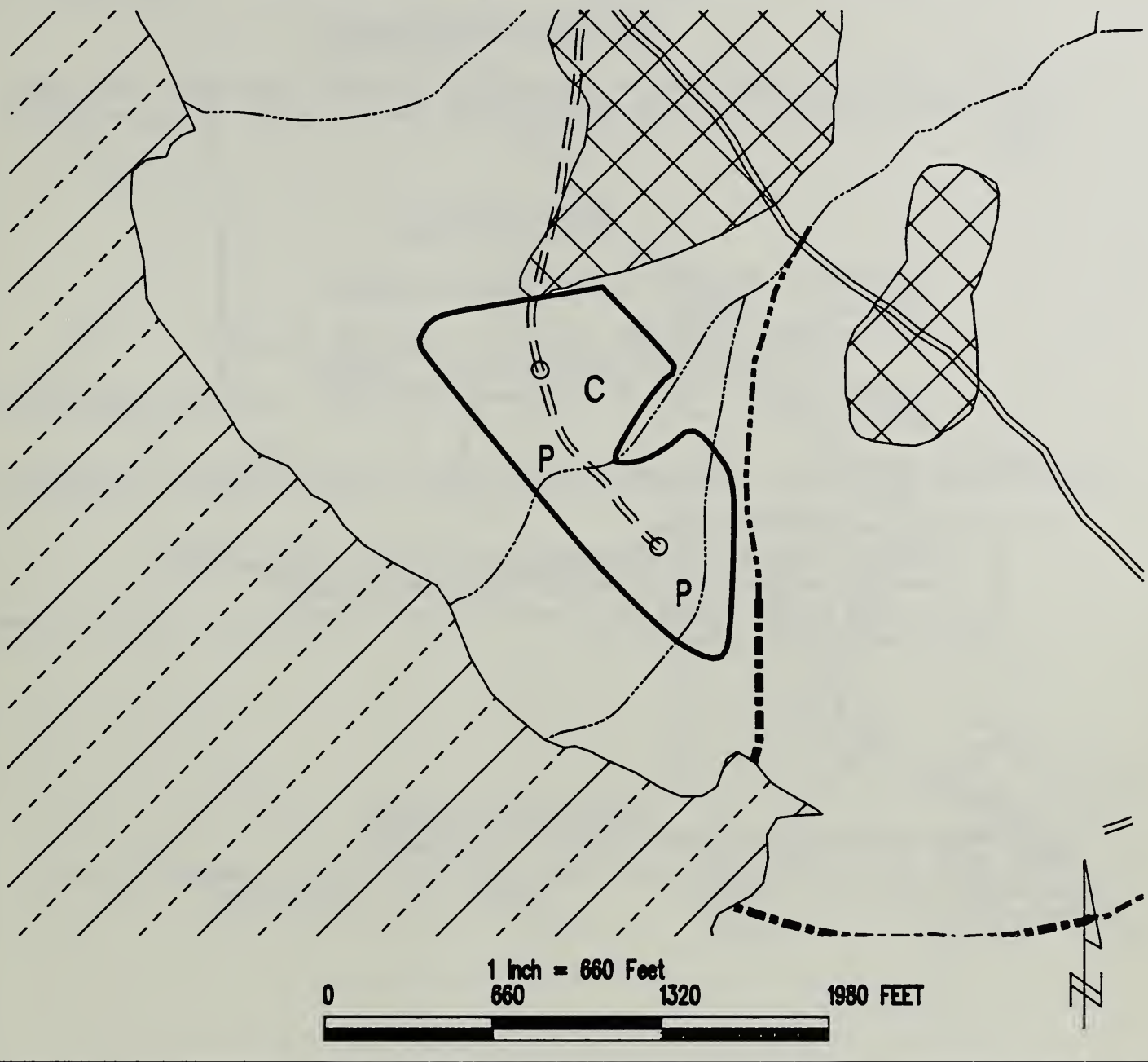
O: Minimize disturbance to stream banks and, protect anadromous fish habitat (BMP 13.16, O5).

D: Splitline on or partial suspend across channel bisecting unit. Recommend partial suspend yarding across other live and ephemeral channels found within unit (BMP's 13.9; 13.16, E11). Minimize debris loading of channels (BMP 13.16, E5). Maintain a 100' buffer on Class II flowing into Class I on east side of unit (BMP 12.6).

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-223 3-312 5-532 5A-532A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 15
Unit Number(s): 224, 313, 533, 533A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Maintain a 100' buffer on Class II stream flowing into Class I stream on south side of unit.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 374 MBF Net Saw 401 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: No change to ROS class - remains Roaded Modified with harvest.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Possible jeopardizing of anadromous & native fish habitat.
O: Protect anadromous fish habitat (BMP 13.16, O5).
D: Maintain a 100' buffer on Class II stream flowing into Class I stream on south side of unit (BMP 12.6).

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-224 3-313 5-533 5A-533A

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 30
Unit Number(s): 225, 314, 534, 534A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Ensure that a 500' uncut old-growth forested strip is retained between this unit and the managed stand on the southeast boundary.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 735 MBF Net Saw 788 MBF Saw/Util
Volume/Acre (net Sawlog): 24 MBF
Recreation Setting: No change to ROS class - remains Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Streambank stability.
O: Minimize channel disturbance (BMP 13.16 O3 & O5).
D: Utilize streambanks of channel as West unit boundary. Avoid debris loading in channel (BMP's 13.2, 3.16 E5).

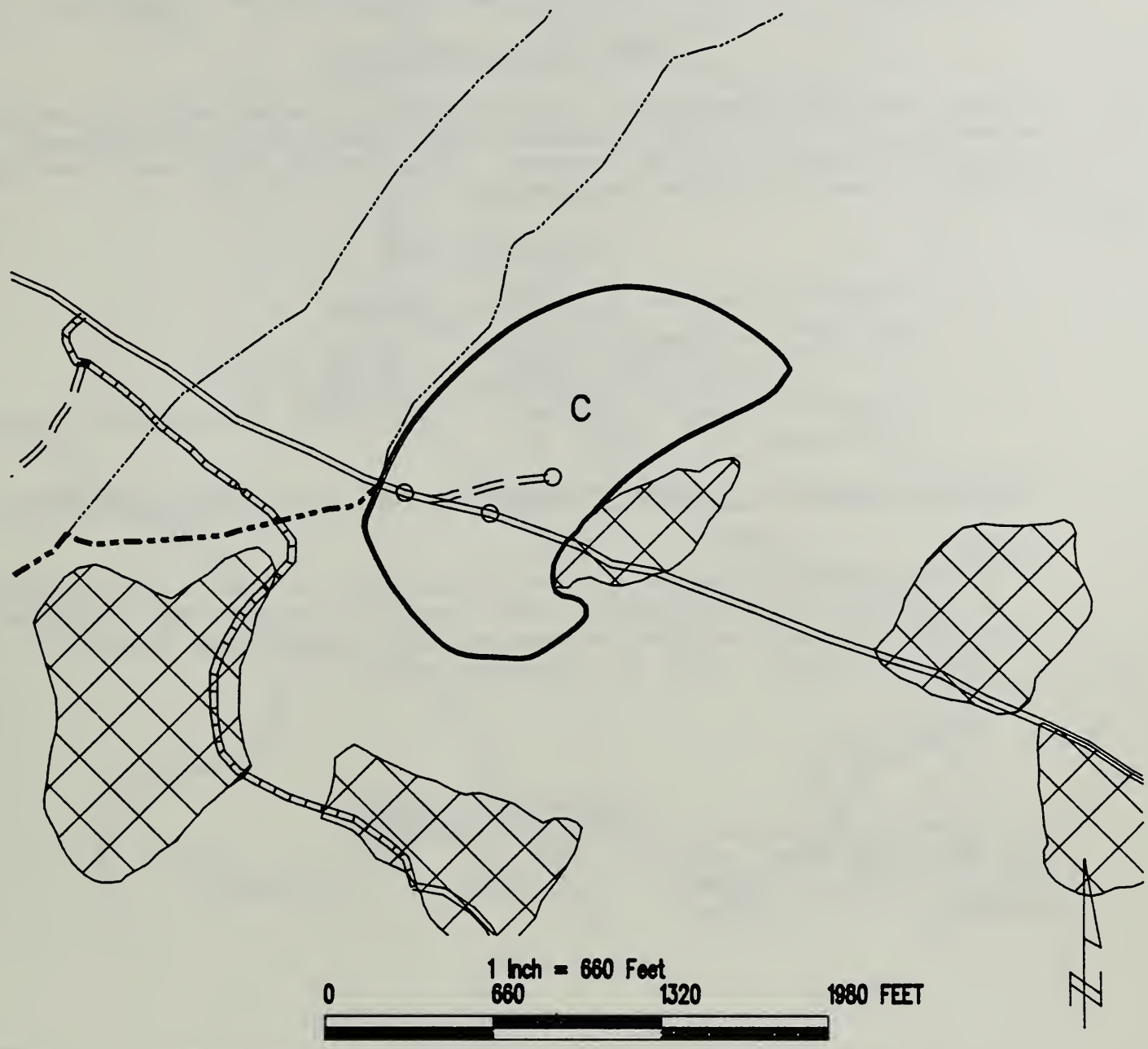
Wildlife
C: Further fragmentation of high value pine marten and deer habitat (HSI: >.8) may result.
O: Maintain travel corridors and winter cover.
D: Provide ≥500' wide uncut strip between this unit and adjacent existing or proposed units. Very small existing unit along south boundary above the road. Should be utilized for future stand diversity. Cut up to this unit. Leave 500' uncut along remainder of boundary.

Visual Resources
C: Unit likely to be seen from lower Portage Bay at an angle.
O: IVQO = Partial Retention. TLMP-recommended VQO's = "partial retention" to "maximum modification".
D: Located outside areas of primary visual concern for this planning effort. No changes recommended to unit as planned.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x 16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-225 3-314 5-534 5A-534A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 14
Unit Number(s): 226, 315, 535, 535A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Maintain an uneven-aged 50 - 100' strip of unmerchantable timber along the northwest boundary to mitigate wildlife concerns. Close the temporary road after logging and silvicultural activities are completed.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 349 MBF Net Saw 374 MBF Saw/Util
Volume/Acre (net Sawlog): 25 MBF
Recreation Setting: No change to ROS class - remains Roaded Modified with harvest.

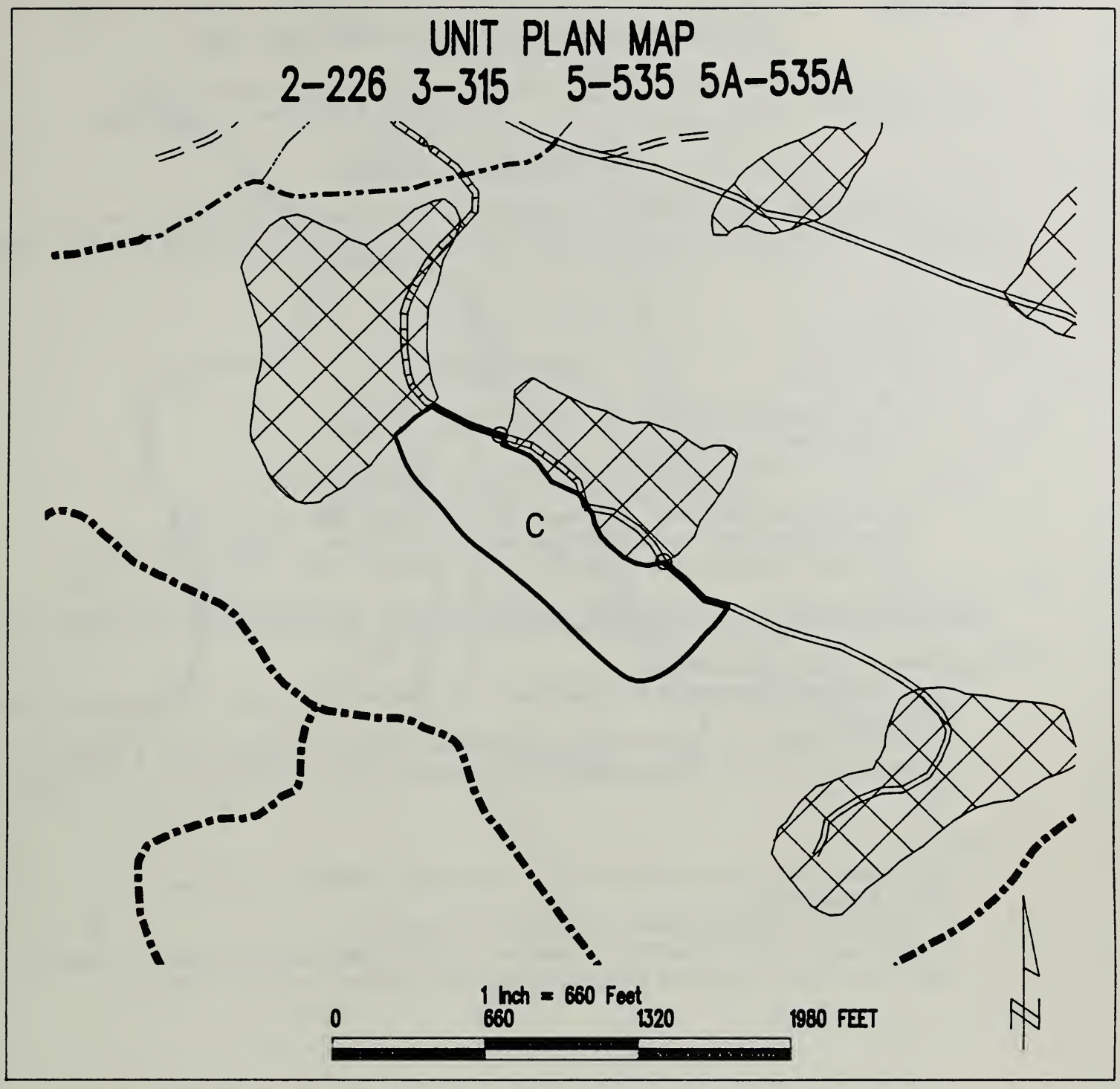
RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Wildlife
C: High value pine marten and deer habitat (HSI: >.8) will be fragmented.
O: Maintain travel corridors, reduce impacts of road-related fragmentation.
D: Leave an uncut corridor between Unit 535A and existing clearcut on northwest corner. Close the temporary road.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-226 3-315 5-535 5A-535A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 30
Unit Number(s): 536 Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

If this unit is to be harvested, a small amount of wildlife habitat may be impacted, mostly affecting waterfowl. Refer to Planned Unit Card for Unit 537A

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 1,062 MBF Net Saw 1,118 MBF Saw/Util
Volume/Acre (net Sawlog): 35.4 MBF
Recreation Setting: Harvest could change ROS class from Semi-Primitive Motorized to Roaded Motorized. Units proximity to Portage Creek could create KV opportunity for recreation fishing.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Possible degradation of anadromous fisheries may occur in Portage Creek (AHMU class I).
O: Should maintain anadromous fish habitat (BMP 13.16, 03, 05, & 06).
D: Maintain a 100' uncut timber buffer along the stream (BMP 12.6; 13.16, E12)

Wildlife
C: Fragmentation and windthrow of old-growth habitat (pine marten HSI:>.8)may occur.
O: Minimize fragmentation and impact on habitat.
D: Maintain > 500' windfirm timbered buffer along unit boundary. Close spur roads when logging and silvicultural activities are complete.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest. conversion to even-aged
SITE PREP: N/A ; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs. CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
5 - 536

	Unit Boundary		Stream - Class I
	Harvest System Boundary		Stream - Class II
	Existing Specified Road		Stream - Class III
	Existing Road - Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 56
Unit Number(s): 537 Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting it to an even-aged stand.

UNIT ATTRIBUTES

Predominant Species: W. hemlock. S. spruce
Age Class: 200+
Unit Volume: 1,385 MBF Net Saw 1,497 MBF Saw/Util
Volume/Acre (net Sawlog): 24.7 MBF
Recreation Setting: Unit is next to Portage Creek which has recreation potential for fishing. Possibly use KV funds to develop short trail and/or parking area on road to access fishing holes. No change to ROS class. Remains Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Degradation of anadromous fish habitat.
O: Protect anadromous fish habitat (BMP 13.16, O5).
D: Maintain a 100' uncut buffer on boundaries located on Portage Bay Creek (AHMU Class I) (BMP 12.6), and a 100' uncut buffer on the northwest tributary. The northwest tributary is found in a floodplain. The 100' uncut buffer should be located on the inner most channel closest to the unit. Do not cross any streams in the flood plain.

Wildlife
C: Total loss of travel corridor near Portage estuary.
O: Maintain travel corridors to Portage Bay and estaury.
D: Retain 200' uncut timbered buffer (split line at boundary of Unit 537A) to divide travel corridor to Portage Bay estuary.

Visual Resources
C: Unit unlikely to be seen from Portage Bay. The VQO may change with recreation development and increase use.
O: IVQO = Maximum Modification. TLMP-recommended VQO's = "partial retention" to "maximum modification".
D: No changes to unit recommended at this time. Landscape architect should be involved with NEPA process in recreation and fisheries development.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A ; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs. CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
5 – 537

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 19
Unit Number(s): 228, 317, 537A Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting stand to even-aged. Delineate boundary >100' from Class I stream. If Unit 536 is harvested along with unit 537A, there will be a reduction in travel corridors and thermal cover for wildlife. Close spur road to help mitigate wildlife concerns.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+
Unit Volume: 526 MBF Net Saw 572 MBF Saw/Util
Volume/Acre (net Sawlog): 28 MBF
Recreation Setting: Unit is next to Portage Creek whick has recreation potential for fishing. Possible use of KV funds to develop short trail and/or parking area on road to access fishing holes. No change to RO% class. Remains Roaded Modified.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Soils/Water Quality/Fisheries
C: Degradation of anadromous fish habitat.
O: Protect anadromous fish habitat (BMP 13.16, 05).
D: Maintain a 100' uncut buffer on southern boundary on Portage Bay Creek (AHMU Class I), and a 100' uncut buffer on the northwest tributary. The northwest tributary is found in a floodplain. The 100' uncut buffer should be located on the inner most channel closest to the unit. Do not cross any streams in the flood plain (BMP 12.6).

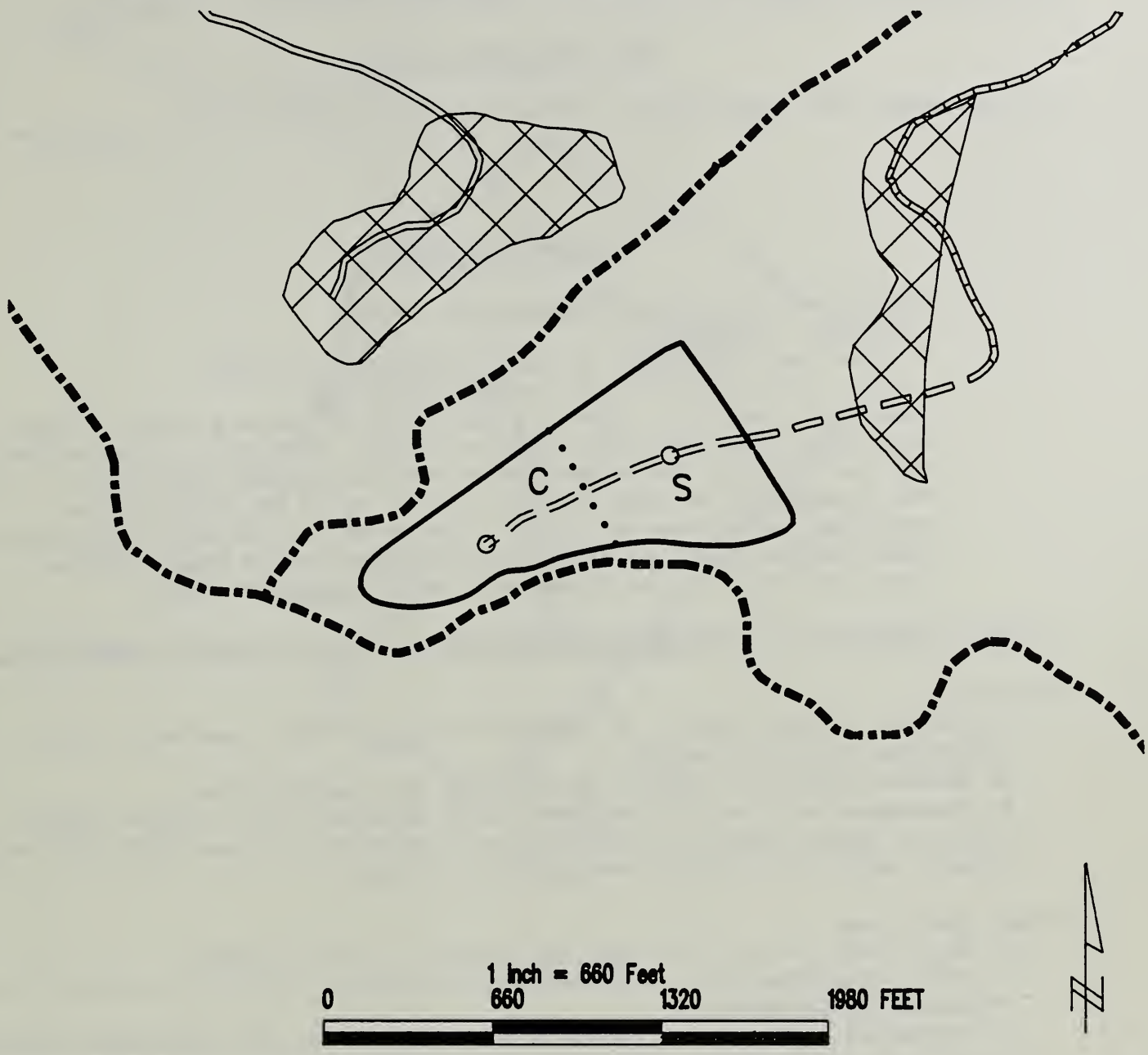
Wildlife
C: Fragmentation along roads will occur. Travel corridors to Portage Bay will be lost.
O: Maintain travel corridors; reduce road related impacts to deer.
D: Close spur road when harvest and cultural activities are completed.

Visual Resources
C: Unit unlikely to be seen from Portage Bay. The VQO may change with recreation development & increased use.
O: IVQO = Maximum Modification. TLMP-recommended VQO's = "partial retention" to "maximum modification".
D: No changes to unit recommended at this time. Landscape architect should be involved with the NEPA process in recreation and fisheries development.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs.; CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
2-228 3-317 5A-537A



	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

Bohemia Mountain Timber Sale PLANNED UNIT CARD

Management Area: S10 LUD: IV VCU: 442 Acres: 79
Unit Number(s): 538 Harvesting Technique: high-lead

UNIT OBJECTIVES SUMMARY

Harvest timber for regeneration, converting to even-aged stand.

UNIT ATTRIBUTES

Predominant Species: W. hemlock, S. spruce
Age Class: 200+ yrs.
Unit Volume: 1,967 MBF Net Saw 2,109 MBF Saw/Util
Volume/Acre (net Sawlog): 24.9 MBF
Recreation Setting: Unit is adjacent to Petersburg Creek - Duncan Salt Chuck Wilderness and would be visible to hikers in the wilderness and just leaving the wilderness on the Portage Bay loop trail. Due to the topography and open muskeg area, it would be difficult to camouflage or lessen the visual impacts of the clearcut. ROS class would change from Semi-Primitive Non-Motorized to Road Modified. About 160 acres in the wilderness would change ROS class.

RESOURCE CONCERN (C), MANAGEMENT OBJECTIVES (O), and MITIGATION DIRECTION (D)

Wildlife
C: Further fragmentation, in conjunction with recent clearcuts, could jeopardize wildlife habitat.
O: Reduce cumulative impacts of harvests and fragmentation.
D: Recommend this unit be deferred until adjacent units recover (10-20 yrs.) or reduce impacts by dividing unit into two portions with 200' buffer between units for thermal cover/travel corridor.

Visual Resources
C: Unit would be seen from Portage Bay for a long distance.
O: IVQO = Modification. TLMP-recommended VQO's = "partial retention" to "maximum modification".
D: Recommend reshaping to reduce blocky shape. Possibly delineate diagonal backline boundary rather than perpendicular to slope.

PRESCRIPTION SUMMARY

OBJ: Regeneration harvest/conversion to even-aged.
SITE PREP: N/A ; REGEN: Naturals; THIN: PCT - 15-20 yrs.; SPACING: 16'x16';
ROTATION: 100 yrs. CONTROL: ; ENHAN: ; MONITORING:
CERTIFIED: ; OTHER

UNIT PLAN MAP
5 - 538

	Unit Boundary		Stream – Class I
	Harvest System Boundary		Stream – Class II
	Existing Specified Road		Stream – Class III
	Existing Road – Reconstruction	P	Partial Suspension
	Proposed Specified Road	C	Cable Yarding
	Proposed Temporary Road	S	Shovel Yarding
	Managed Stand	H	Helicopter Yarding
	Water	O	Landing

F Appendix

Appendix G

APPENDIX G

Road Descriptions

The following is a capsulation of the interdisciplinary team (IDT) analysis of the proposed road segments in the preferred alternative, Alternative 5A. Also included is one road description for the possible Kake/Portage connection, although it is not in the preferred alternative. These descriptions are not "road cards," but the results of the IDT analysis of those cards at this point. The road cards for all alternatives are part of the planning file and can be seen in that file. They will continue to be used through the layout and harvest of units and the survey and construction of roads as described in the Forest Service Manual.

It has to be anticipated that there will be some minor changes to the roads as depicted on these descriptions. It is virtually impossible, without final design of every section of road, not to have some changes. Exact conformance to preset lines, regardless of values, would not be proper management. Opportunities not only to protect newly discovered situations but also to optimize management intent without changing the environmental impacts have to be anticipated and instituted. The resources, as they are now known and analyzed, have been protected or enhanced to the greatest extent practicable.

If changes and the associated impacts develop which are outside the scope of the impacts envisioned with this Final EIS, additional documentation may be required.

Road description narratives refer to lettered segments on the road description photos. The road description map and photo contain segments of roads in all alternatives as well as the units in the preferred alternative. The existing Portage Bay log transfer facility is also shown.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 424

ROAD NUMBER: 6030 FUNCTIONAL CLASS: Collector ENTRY CYCLE: Constant

LENGTH: 3.7 miles TRAFFIC SERVICE LEVEL: C DESIGN SPEED: 20 MPH

TERMINI: End of existing road 6030 (T57S,R76E,Sec.8) to the lower bridge crossing of Duncan Salt Chuck Creek (T57S,R76E,Sec.2).

DESIGN VEHICLE: Passenger Automobile CRITICAL VEHICLE: Lowboy HIGHWAY SAFETY ACT: Yes

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 3

INTENDED PURPOSE: To provide access for a full array of multiple use management: roaded recreation, timber access and forest administration.

TRAFFIC MANAGEMENT STRATEGY: Keep open for forest administration and recreation.

EROSION CONTROL: Avoid side casting excavated material at point 'A' for 150 feet (south bridge/cmpa approach) along Class II stream. Haul excavated material and deposit in approved waste area. BMP's 14.12 and 14.13 apply.

ROAD LOCATION: The main objective is to place the road along the ridgetop with roadway cross-drainage to the south, away from Duncan Salt Chuck Creek.

ROCK PITS: Flat topography along this segment, little if any quality rock available for road construction. Consider crushed aggregate, 4 inch minus, from existing pit at Banana Pass on the existing 6030 road. Large rock pits may be needed due to the lack of quality rock sources. Coordinate with the landscape architect on location and access design of rock pits. Consider rehabilitation of rock pits located adjacent to road 6030.

STREAM CROSSINGS: A temporary bridge will be located at point 'A', a Class II stream. At a later date, a permanent culvert or bottomless arch will be installed. The intent is that this structure be able to pass resident fish.

An estimated 60 foot bridge will be necessary to cross Duncan Salt Chuck Creek (a class I stream) at point 'B'. The north side bridge abutment will be located upon a small floodplain. An overflow culvert will be needed. A turnout/parking area is to be constructed on the north side of the bridge site. BMP's 14.17 and 14.36 apply.

TIMING RESTRICTIONS: Timing restrictions apply only to in-stream work where water quality standards will be compromised. Out-of-stream construction can be conducted outside of "timing windows".

At site 'A' a timing constraint is not recommended during the temporary bridge construction, but a timing window of June 1, through August 15 will be required during construction of the permanent culvert or bottomless arch due the chance that sedimentation from construction will be harmful to Coho salmon egg incubation in Duncan Salt Chuck Creek. BMP 14.64 applies.

A timing constraint on bridge construction at site 'B' which allows in stream construction from July 15, through August 15 is required to protect steelhead trout, pink and Coho salmon egg incubation in Duncan Salt Chuck Creek. BMP 14.64 applies.

PLANNED ROAD DESCRIPTION CONT.

PROJECT NAME: Bohemia Mountain Timber Sale ROAD NUMBER: 6030

FUTURE NEEDS: This segment of road 6030 may contribute to the Kake - Portage connection.

VEGETATIVE MGT: No special needs or considerations.

IMPLEMENTATION MONITORING: A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife concerns surface during road location.

Consider Central Tire Inflation or low pressure radial tires where marginal rock quality may cause a breakdown of road surfacing material. BMP 14.84 applies.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits. A bridge design engineer and landscape architect to analyze the Duncan Salt Chuck Creek crossing. The landscape architect's interest is primarily the style of bridge to be used and provisions for parking because of the high potential recreational fishing use.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 424

ROAD NUMBER: 6030 FUNCTIONAL CLASS: Collector ENTRY CYCLE: Constant

LENGTH: 5.2 miles TRAFFIC SERVICE LEVEL: D DESIGN SPEED: 20 MPH

TERMINI: Lower bridge crossing Duncan Salt Chuck Creek (T57S, R76E, Sec.2) to bridge crossing unnamed stream in T56S, R75E, Sec.23.

DESIGN VEHICLE: Lowboy CRITICAL VEHICLE: Lowboy HIGHWAY SAFETY ACT: No

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 2

INTENDED PURPOSE: To provide access for a full array of multiple use management: roaded recreation, timber access and forest administration.

TRAFFIC MANAGEMENT STRATEGY: Restrict recreation traffic to high clearance vehicles.

EROSION CONTROL: Control excavation and sediment at stream crossings. BMP's 14.12 and 14.13 apply.

ROAD LOCATION: The main objective is to place the road along the toe of the slope while crossing the numerous drainages in stable reaches.

ROCK PITS: Little if any quality rock available for road construction. A possible pit location exists at point 'C'. Large rock pits may be needed due to the lack of quality rock sources. Coordinate with the landscape architect. Consider rehabilitation of rock pits located adjacent to road 6030.

STREAM CROSSINGS: Between points 'D' and 'E' there are 11 Class I and Class II stream crossings requiring CMPs ranging from a estimated 24" to 144" diameter. All Class I stream crossings will require salmon fry passage through culverts. All Class II streams require the passage of resident fish through the structure.

A 12' open bottom CMPA or 40 foot bridge is required at point 'E', a salmon spawning tributary. BMP's 14.17 and 14.36 apply.

An estimated 40 foot bridge is recommended to cross an unnamed Class II stream at point 'F'.

TIMING RESTRICTIONS: All 11 Class I and Class II streams between points 'D' and 'E' will require timing constraints on in-stream construction from June 1, through August 15. This is needed to protect Coho and pink salmon egg incubation. BMP 14.64 applies.

A timing restriction at Point 'E' is not recommended because the downstream area to the beach is bedrock and is not a salmon spawning channel.

A timing restriction is not recommended at point 'F' because of the bedrock structure of the crossing, very little or no sands or gravels. There is a substantial barrier within a quarter of a mile from the beach blocking salmon passage.

PLANNED ROAD DESCRIPTION CONT.

PROJECT NAME: Bohemia Mountain Timber Sale ROAD NUMBER: 6030

FUTURE NEEDS: This segment of road 6030 provides access to approximately 60 million board feet of adjacent timber. It can be extended approximately 2 miles.

VEGETATIVE MGT: Maintain a 100 foot wildlife travel corridor between road 6030 and the unnamed Class I stream that parallels this segment of road. This stream riparian zone offers a wide variety of wildlife habitat.

IMPLEMENTATION MONITORING: Post construction monitoring needed to insure Class I fish stream culverts continue to pass Coho fry.

A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife concerns surface during road location.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits. A Geotech engineer to analyze the unstable blue clay deposit located directly above the stream crossing at site 'E'. A bridge design engineer and a fisheries biologist to analyze the Class I stream crossings and conduct a cost benefit analysis.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 424

ROAD NUMBER: 45607 FUNCTIONAL CLASS: Local ENTRY CYCLE: Intermittent

LENGTH: 0.65 miles TRAFFIC SERVICE LEVEL: D DESIGN SPEED: 10 MPH

TERMINI: This road begins at the end of the proposed 6030 road (T56S, R75E, Sec. 23) and ends in Sec. 26.

DESIGN VEHICLE: Log Truck CRITICAL VEHICLE: Mobile Yarder HIGHWAY SAFETY ACT: No

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 1

INTENDED PURPOSE: To provide access for timber management activities, forest administration and recreation.

TRAFFIC MANAGEMENT STRATEGY: Close road by grass seeding and fertilizing road surface to retard alder growth. Allow off road vehicles.

EROSION CONTROL: Waterbar if necessary. BMP 14.24 applies.

ROAD LOCATION: The main objective is to place the road along the toe of the slope while maintaining a maximum distance from the riparian zone of the adjacent creek. A switchback will be necessary at the intersections of roads 45607 and 45608.

ROCK PITS: Little if any quality rock available for road construction. Large rock pits may be needed due to the lack of quality rock sources. Coordinate the location and design with the landscape architect.

STREAM CROSSINGS: No Class I, II or III streams crossed.

FUTURE NEEDS: This road can be extended approximately one mile.

VEGETATIVE MGT: Leave screen of vegetation between road and Class III stream that parallels to provide sediment filter and wildlife corridor. The Class III stream turns into a Class I Pink salmon stream near the beach.

TIMING RESTRICTIONS: None.

IMPLEMENTATION MONITORING: A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife concerns surface during road location.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 424

ROAD NUMBER: 45608 FUNCTIONAL CLASS: Local ENTRY CYCLE: Intermittent

LENGTH: 0.60 miles TRAFFIC SERVICE LEVEL: D DESIGN SPEED: 10 MPH

TERMINI: This road begins at an intersection with the proposed 45607 road (T56S, R75E, Sec. 23) and ends in Sec. 22.

DESIGN VEHICLE: Log Truck CRITICAL VEHICLE: Mobile Yarder HIGHWAY SAFETY ACT: No

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 1

INTENDED PURPOSE: To provide access for timber management activities, forest administration and recreation.

TRAFFIC MANAGEMENT STRATEGY: Close road by grass seeding and fertilizing road surface to retard alder growth. Allow off road vehicles.

EROSION CONTROL: Waterbar if necessary. BMP 14.24 applies. On sideslopes of 55% and greater do not sidecast excavated material, endhaul to a designated waste area.

ROAD LOCATION: The main objective is to place the road along the upper slope of the mountain face to facilitate uphill logging systems. Keep to benches to minimize cut and fill heights for road and landing construction. Forest Development road ends at unit 520 boundry.

ROCK PITS: Little if any quality rock available for road construction. Coordinate location and design with the landscape architect.

STREAM CROSSINGS: No Class I, II or III streams crossed.

FUTURE NEEDS: This road is not expected to be extended for future timber harvest. There is a leave strip that may be harvested at some future time.

VEGETATIVE MGT: No special needs or consideration identified.

TIMING RESTRICTIONS: None

IMPLEMENTATION MONITORING: A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife concerns surface during road location.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 424

ROAD NUMBER: 45602 FUNCTIONAL CLASS: Local ENTRY CYCLE: Intermittent

LENGTH: 0.50 miles TRAFFIC SERVICE LEVEL: D DESIGN SPEED: 10 MPH

TERMINI: This road begins at an intersection with the proposed 45601 road (T57S, R76E, Sec. 5) and ends in Sec. 4.

DESIGN VEHICLE: Log Truck CRITICAL VEHICLE: Mobile Yarder HIGHWAY SAFETY ACT: No

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 1

INTENDED PURPOSE: To provide access for timber management activities, forest administration and recreation.

TRAFFIC MANAGEMENT STRATEGY: Close road by grass seeding and fertilizing road surface to retard alder growth. Allow off road vehicles.

EROSION CONTROL: Waterbar if necessary. BMP's 14.21 and 14.24 apply.

ROAD LOCATION: The main objective is to place the road along the upper slope of the mountain face to facilitate uphill logging systems.

ROCK PITS: Little if any quality rock available for road construction. Coordinate location and design with the landscape architect.

STREAM CROSSINGS: Several class III streams crossed. BMP's 13.16, 14.6, 14.9, 14.10, 14.11, 14.12, 14.13 apply.

FUTURE NEEDS: This road is expected to be extended for future timber harvest.

VEGETATIVE MGT: Seed cut and fill slopes immediately after construction. BMP's 14.8.1 and 14.7.6 apply.

TIMING RESTRICTIONS: None

IMPLEMENTATION MONITORING: A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife species surface during road location.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 424

ROAD NUMBER: 45601 FUNCTIONAL CLASS: Local ENTRY CYCLE: Intermittent

LENGTH: 4.50 miles TRAFFIC SERVICE LEVEL: D DESIGN SPEED: 10 MPH

TERMINI: This road begins at an intersection with the existing 6030 road (T57S, R76E, Sec. 8) and ends in Sec. 4.

DESIGN VEHICLE: Log Truck CRITICAL VEHICLE: Mobile Yarder HIGHWAY SAFETY ACT: No

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 2

INTENDED PURPOSE: To provide access for timber management activities, forest administration and recreation.

TRAFFIC MANAGEMENT STRATEGY: Keep road open after timber sale for administration and recreational use.

EROSION CONTROL: Waterbar if necessary. BMP's 14.21 and 14.24 apply.

ROAD LOCATION:The main objective is to access the area north of Duncan Salt Chuck Creek.

ROCK PITS: Little if any quality rock available for road construction. Coordinate location and design with the landscape architect.

STREAM CROSSINGS: An estimated 50 foot bridge or bottomless pipe arch will be necessary to cross Duncan Salt Chuck Creek (a class I stream). BMP's 14.17 and 14.36 apply.

Several class III streams crossed. BMP's 14.10, 14.60 and 14.11 apply.

TIMING RESTRICTIONS: A timing constraint on bridge or bottomless arch construction which allows in stream construction from June 1, through September 1 is required to protect Coho salmon egg incubation in Duncan Salt Chuck Creek. BMP 14.64 applies.

FUTURE NEEDS: This road is not likely to be extended for future timber harvest.

VEGETATIVE MGT: Seed cut and fill slopes immediately after construction. BMP's 14.8.1 and 14.7.6 apply.

IMPLEMENTATION MONITORING: A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife concerns surface during road location.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 424

ROAD NUMBER: 45603 FUNCTIONAL CLASS: Local ENTRY CYCLE: Intermittent

LENGTH: 2.75 miles TRAFFIC SERVICE LEVEL: D DESIGN SPEED: 10 MPH

TERMINI: This road begins at an intersection with the existing 6030 road (T57S, R76E, Sec. 2) and ends in T56S, R75E, Sec. 36.

DESIGN VEHICLE: Log Truck CRITICAL VEHICLE: Mobile Yarder HIGHWAY SAFETY ACT: No

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 2

INTENDED PURPOSE: To provide access for timber management activities, forest administration and recreation.

TRAFFIC MANAGEMENT STRATEGY: Keep road open after timber sale for administration and recreational use.

EROSION CONTROL: On sideslopes of 55% and greater do not sidecast excavated material, endhaul to a designated waste area.

ROAD LOCATION: The main objective is to place the road along the upper slope of the mountain face to facilitate uphill logging systems. Keep to benches to minimize cut and fill heights for road and landing construction.

ROCK PITS: Little if any quality rock available for road construction. Coordinate location and design with the landscape architect.

STREAM CROSSINGS: Several class III streams crossed. BMP's 14.10, 14.60 and 14.11 apply.

FUTURE NEEDS: This road will be extended for future timber harvest.

VEGETATIVE MGT: Seed cut and fill slopes immediately after construction. BMP's 14.8.1 and 14.7.6 apply.

TIMING RESTRICTIONS: None.

IMPLEMENTATION MONITORING: A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife concerns surface during road location.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 442

ROAD NUMBER: 43010 FUNCTIONAL CLASS: Local ENTRY CYCLE: Intermittent

LENGTH: 0.75 miles TRAFFIC SERVICE LEVEL: D DESIGN SPEED: 10 MPH

TERMINI: This road begins at an intersection with the existing 6319 road (T56S, R76E, Sec. 22) and ends in Sec. 26.

DESIGN VEHICLE: Log Truck CRITICAL VEHICLE: Mobile Yarder HIGHWAY SAFETY ACT: No

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 1

INTENDED PURPOSE: To provide access for timber management activities, forest administration and recreation.

TRAFFIC MANAGEMENT STRATEGY: Close road by grass seeding and fertilizing road surface to retard alder growth. Allow off road vehicles.

EROSION CONTROL: Waterbar if necessary. BMP 14.24 applies.

ROAD LOCATION: The main objective is to place the road along the upper slope of the mountain face to facilitate uphill logging systems. Keep to benches to minimize cut and fill heights for road and landing construction.

ROCK PITS: Existing rock pits are available on the 6319 and 6317 roads. Coordinate the location, design and expansion with the landscape architect.

STREAM CROSSINGS: Several class III streams crossed. BMP's 14.10, 14.60 and 14.11 apply.

FUTURE NEEDS: This road can be extended approximately one mile.

VEGETATIVE MGT: No special needs or considerations identified.

TIMING RESTRICTIONS: None.

IMPLEMENTATION MONITORING: A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife concerns surface during road location.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 442

ROAD NUMBER: 43015 FUNCTIONAL CLASS: Local ENTRY CYCLE: Intermittent

LENGTH: 0.60 miles TRAFFIC SERVICE LEVEL: D DESIGN SPEED: 10 MPH

TERMINI: This road begins at an intersection with the existing 6319 road (T57S, R77E, Sec. 13) and ends in Sec. 14.

DESIGN VEHICLE: Log Truck CRITICAL VEHICLE: Mobile Yarder HIGHWAY SAFETY ACT: No

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 2

INTENDED PURPOSE: To provide access for timber management activities, forest administration and recreation.

TRAFFIC MANAGEMENT STRATEGY: Keep road open after timber sale for administration and recreational use.

EROSION CONTROL: Waterbar if necessary. BMP 14.24 applies.

ROAD LOCATION: The main objective is to access harvest unit 537 and provide future access to Portage Creek Falls for recreation and proposed fish pass construction. Provide a parking and turnaround area for trail to falls.

ROCK PITS: Existing rock pits are available on road 6319. Coordinate the location, design and expansion with the landscape architect.

STREAM CROSSINGS: No Class I, II or III streams crossed.

FUTURE NEEDS: A one half mile spur may be constructed off this road to access the proposed Portage Creek Falls fish pass.

VEGETATIVE MGT: No special needs or considerations were identified.

TIMING RESTRICTIONS: None.

IMPLEMENTATION MONITORING: A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife concerns surface during road location.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits.

PLANNED ROAD DESCRIPTION

PROJECT NAME: Bohemia Mountain Timber Sale MGT AREA: S-10 VCU: 424/442

ROAD NUMBER: 6031 FUNCTIONAL CLASS: Collector ENTRY CYCLE: Constant

LENGTH: 7.5 miles TRAFFIC SERVICE LEVEL: C DESIGN SPEED: 20 MPH

TERMINI: Junction of proposed road 6030 (T57S,R76E,Sec.2) to an intersection with existing road 6309 (T57S,R77E,Sec.14).

DESIGN VEHICLE: Passenger Automobile CRITICAL VEHICLE: Lowboy HIGHWAY SAFETY ACT: Yes

MAINTENANCE LEVELS: (ACTIVE SALE) 3 POST SALE: 3

INTENDED PURPOSE: To connect the Kake transportation network with the Portage Bay transportation network providing access for a full array of multiple use management: roaded recreation, timber access and forest administration.

TRAFFIC MANAGEMENT STRATEGY: Keep open for forest administration and recreation.

EROSION CONTROL: No unusual problems anticipated on this road segment.

ROAD LOCATION: The main objective for road location is to keep the road as far back from the Goose Cove estuary at the head of Portage Bay to reduce impacts to estuarine wildlife habitat.

ROCK PITS: Flat topography along this segment, little if any quality rock available for road construction. Consider crushed aggregate, 4 inch minus, from existing pits. Large rock pits may be needed due to the lack of quality rock sources. Coordinate with the landscape architect on location and access design of rock pits. Consider rehabilitation of rock pits located adjacent to road 6031.

STREAM CROSSINGS: There are four class I/II fish stream crossings. Metal pipe arches are proposed for three small stream and an approximately 160 foot bridge to be installed on Portage Creek. BMP's 14.17 and 14.36 apply.

TIMING RESTRICTIONS: Timing restrictions apply only to in-stream work where water quality standards will be compromised. Out-of-stream construction can be conducted outside of "timing windows".

A timing window of June 1, through August 15 will be required during construction of the permanent culverts or bottomless arch due the chance that sedimentation from construction will be harmful to Coho salmon egg incubation. BMP 14.64 applies.

A timing constraint on bridge construction at the Portage Creek site which allows in stream construction from July 15, through August 15 is required to protect steelhead trout, pink and Coho salmon egg incubation. BMP 14.64 applies.

FUTURE NEEDS: This segment of road 6030 may contribute to a Kake - Petersburg connection.

VEGETATIVE MGT: No special needs or considerations.

PLANNED ROAD DESCRIPTION CONT.

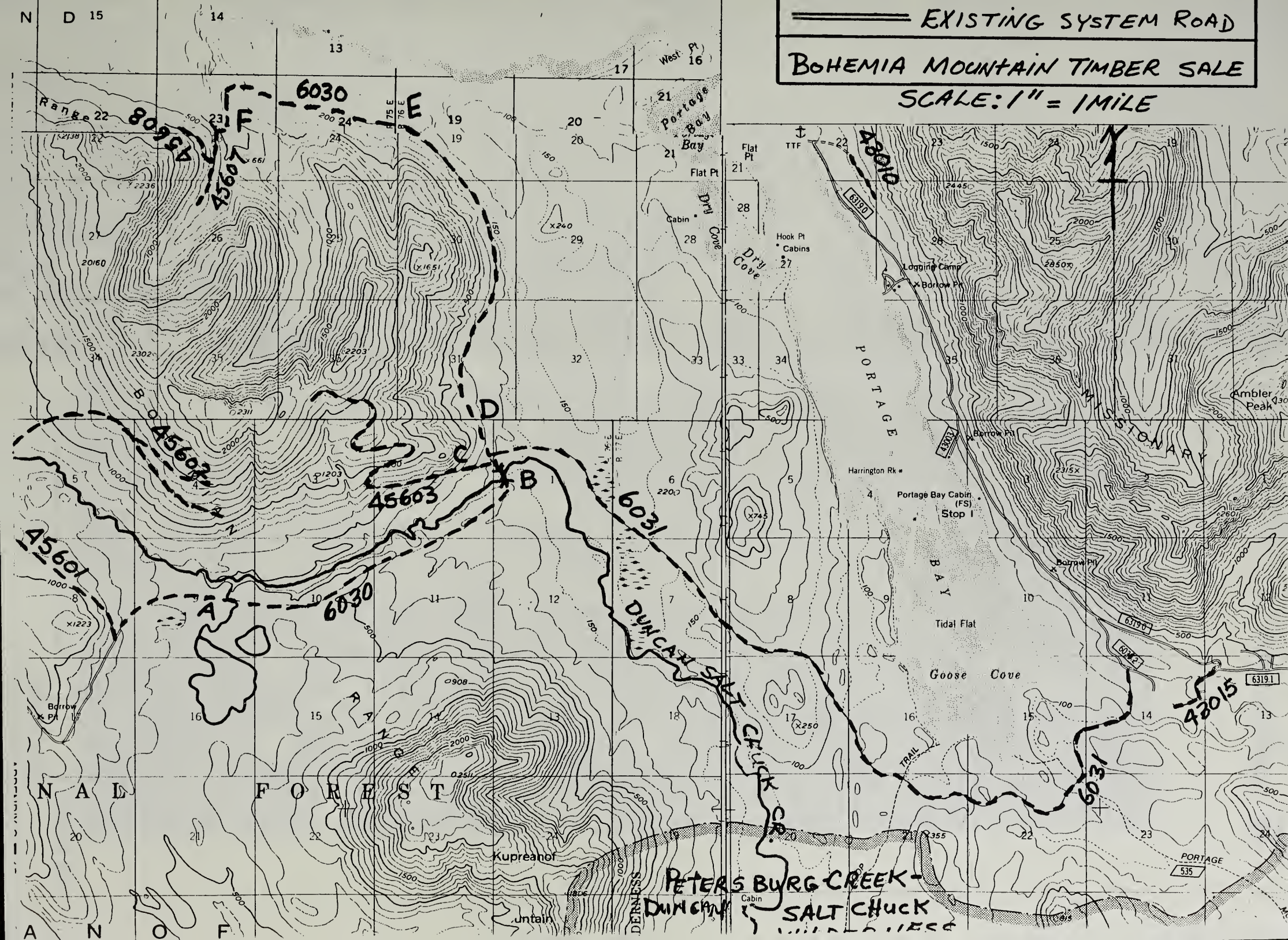
PROJECT NAME: Bohemia Mountain Timber Sale ROAD NUMBER: 6031

IMPLEMENTATION MONITORING: A basic soil and water review will be conducted to insure application of Best Management Practices (BMP's).

OTHER CONSIDERATIONS: Wildlife biologist input if raptor nests or other important wildlife concerns surface during road location.

Consider Central Tire Inflation or low pressure radial tires where marginal rock quality may cause a breakdown of road surfacing material. BMP 14.84 applies.

SPECIALISTS NEEDED: Landscape architect and Geotech Engineer to plan rock pits. A bridge design engineer and landscape architect to analyze the Portage Creek crossing. The landscape architect's interest is primarily the style of bridge to be used and provisions for parking because of the high potential recreational fishing use.


EXISTING SYSTEM ROAD
BOHEMIA MOUNTAIN TIMBER SALE
SCALE: 1" = 1 MILE
Range 22
West Pt
Portage Bay
Flat Pt
Dry Cove
Cabin
Hook Pt
Cabins
Logging Camp
Borrow Pit
TTF
PORTAGE BAY
Harrington Rk
Portage Bay Cabin (FS)
Stop 1
Tidal Flat
Goose Cove
Ambler Peak
MYSTONARK
DUNCAN SALT CHUCK CR.
TRAIL
PORTAGE
535
Kupreanof
DERNESS
NATIONAL FOREST
PETERS BURG CREEK
DUNCAN
SALT CHUCK
45609
45607
45602
45601
45603
6030
6031
43010
43015
A
B
C
D
E
F


PROPOSED SYSTEM ROAD
EXISTING SYSTEM ROAD
LOG TRANSFER FACILITY
SCALE: 1" = 0.32 MILES
516
515
519
514
513
N
513
511
512
510
509
508
45603
505
506
507
6030
522
523
524
528
529
530
532
533
534
536
537
43015
FISH BARRIER
N

Appendix H

APPENDIX H

COMMENTS ON DRAFT EIS AND FOREST SERVICE RESPONSE

This appendix includes a copy of the letters responding to the Draft EIS. The date each letter was received is date stamped or written on the first page of each letter. Each comment was then numbered in the margin. Following each letter, the numbered comments are paraphrased and the Forest Service response is described.

The following comments were received after the close of the comment period. They were considered to the extent possible, given the date received, but, except for the EPA comments, were not given a formal Forest Service response in this Appendix. Because EPA has statutory responsibility for water quality and the Forest Service must meet the Clean Water Act requirements, responses to those comments are included.

P. O. Box 1530
Petersburg, Alaska 99833
June 15, 1991

Tamara S. Malone
P. O. Box 309
Petersburg, Alaska 99833

Dear Ms. Malone:

The following are my comments on the Bohemia Mountain Timber Sale DEIS.

I feel this sale must be deferred until completion of the TLMP revision. Therefore I favor Alternative 1 with the addition that the Stikine area recommend Duncan Salt Chuck River for Wild River classification.

Alternative 2

There are too many stream crossings including Segment 2 of Duncan Salt Chuck River. It is a below cost sale. It does avoid hazard soils.

Alternative 3

I consider this the best action alternative. It is the only alternative to yield a positive return to the U.S. treasury. There is no Kake-Portage connection, no impact on the LUD 2 area or wilderness. It avoids roads on wetlands. It is the only action alternative to fully protect the Duncan Salt Chuck River.

I can see problems with harvest in riparian areas and fragmentation of the Portage Bay area.

Alternative 4

A below cost sale, a road crossing of the Duncan Salt Chuck River, Segment No. 2.

Alternative 5

A below cost sale. Adverse impact on subsistence, loss of riparian wildlife habitat, impact of roads with 30 stream crossings, the Kake-Portage connection, impact on wilderness, obviously the worst alternative.

Alternative 5 A

I am very disappointed to see this designated as the preferred alternative.

It is next to the most costly alternative
There is too great an impact on riparian wildlife habitat, too many stream crossings, increased competition for subsistence resources, elimination of Segment 2 of Duncan Salt Chuck River for Wild River Classification, invasion of the Lud 2 area with a road I do not consider a vital transportation link.

Monitoring will be after the fact and the damage done. What do you do about deer winter range once it is gone? What do you do about soil damage after it has occurred? What will you do if access creates too much pressure on traditional subsistence resources? 1

What constitutes a "wildlife habitat improvement project? This needs to be spelled out. How do you mitigate the effect of destruction of habitat?

2.

Most of the past logging has occurred in deer winter range. This alternative shows a fragmented landscape with maximum edge effect.

This alternative along with 5 has the highest harvest in riparian zones, crossings of riparian zones, highest cumulative effect on marten, highest timber harvest on wetlands.

Forest management under TLMP I does not meet the requirements of NFMA, NEPA, or TTRA. New projects should not be started until after TLMP II is completed. One of the requirements for the revision was to bring TLMP into compliance with NFMA.

Fish

In the absence of logging are stream stabilization measures necessary in V notches on Bohemia Mountain? 2

In TLMP I sport fish and commercial fish were rated 5 and timber 2. The most valuable resource of the area is fish! 3

Water quality degradation, even temporary, violates State Water Quality Standards. Also, silt in the stream represents loss of soil, the basic forest resource. 4

Wildlife

I find the Regional Guide of 1983 unacceptable . I was one of those appealing the Guide because of the impact on wildlife it would have. For one thing it violates NFMA and threw out what were reasonable provisions for protection of wildlife in the Southeast Area Guide.

Is there field data to support or confirm the data in the computer models? 5

There will be no chance for deer populations to recover if they lose their winter range. 6

Survival of marten should not be linked to whether they are to be trapped. NFMA requires maintenance of biological diversity. 7

There will inevitably be bear-logging camp conflicts that result in death of the bear. If this is to be a year-round camp there will be hunting and trapping contributing to the decline in deer, bear and marten. I would wager there will also be illegal shooting of eagles. This may not be common but it does occur. 8

Strangely, there is no apparent recognition of the lack of wildlife values in these "vigorous second growth stands." I am amazed to see the reference to "highly prodictove even-aged, young growth stands. This is an outdated attitude ignoring biological diversity and shows lack of recognition of the difference between a tree farm and a forest. This is a far cry from New Perspectives. 9

Show how you will "enhance wildlife opportunities" in logged over areas. 10

Subsistence

There is a need to identify areas of importance to subsistence.

Road access will only increase competition for subsistence resources. 11

Timber

p. 3-40 shows the following: Vol. Class 6 (20-50 MBF) = 11% of CFL
" " 5 (20-30 MBF) = 42% " "
" " 4 (8-20 MBF) = 47% " "

What we need to know is the volume class 6 to be included in the sale area under the different alternatives since this is the class of most value to wildlife. 12

There should be a map showing the areas to be logged, the volume classes and the key winter wildlife habitat. 13

There should be a discussion of slope failures (Appendix B) in the period after the roots die. What management practices exist to "avoid interrupting the natural surface and sub-surface drainage patterns and minimizing disturban e to soil surface?" 14

Below cost timber sales

I am opposed to all alternatives where the sale loses money. Recent figures (CHEC) indicates that the Tongass lost over 28 million dollars in 1990. The loss in the Stikine area was over 10 milion. I oppose using timber sales as a direct subsidy, a welfare program if you will, to keep the timber industry afloat. 15

The most important figures (Timber economics 4-43) in table 4-18. page 4-43, are those showing the net value, ($ MBF). No loss for alternative 1, a $60 profit per MBF for #3, and losses of $29 - #111 for the other alternatives. The preferred alternative loses $54 or $60/MBF. This doesn't make sense.

Independent Timber sales

I am concerned as to whether these so-called "independent" timber sales can be bid on by ALP or KPC. Should these not be small business set-asides? 16

Having allowed the "independent" timber sales such as Portage-Twelve mile and Hamilton Creek to go to ALP in the past did nothing to meet the need of independent loggers. That these did not sell indicates to me that either these units were too large for small operators or there was no demand for the timber.

Kake-Petersburg Road

Development of the Kake-Portage road will almost inevitably lead to pressure for completion of the road to Petersburg. The Forest Service does not seem to have thought this issue through.

The first issue is that of the impact on the City of Kupreanof. having been through a long battle to rid itself of a claimed road right-of-way and settled for a six foot trail, it would appear that the issue was settled as far as the City was concerned.

Although I sold the buildings, I do still own property in Kupreanof. I do not look forward to another battle as we went through. We were subjected to a great deal of pressure and many lies were told to force a right of way. I would urge the Forest Service to not re-open the issue by construction of the Kake-Portage road. 17

A map should be included to show where the Forest Service considers there is still an existing right-of way. The 1986 Southeast Transportation Plan, (State of Alaska, Alaska Department of Transportation and Public Facilities, Southeast Region) considered and then dropped the proposal for a Kake-Petersburg Road. There is an earlier document that compares the costs of a bridge or a ferry.

4.

Wild River Designation

I see no reason designation o the Duncan Salt Chuck River has to be tied to the Bohemia Mountain timber sale. No logging or road building should be considered in this area until after completion of the TLMP revision. Planning for future timber sales should recognize the suitability of both sections 1 and 2 for wild river classification. This area was part of the original Petersburg-Salt Chuck Wilderness proposal.

Duncan Salt Chuck River is more valuable in its natural state than as the basis for a below cost timber sale. The fishery is the most valuable resource of the area, fish having a rating of 5 and timber of 2 under TLMP 1. ADF&G lists this as one of 19 high value watersheds in Southeast Alaska. 18

Add to this the recreation and wildlife values of the undisturbed area. All 12 miles should be classified as Wild River.

I do not think failure of the DEIS for TLMP 2 to recommend this river for classification should be the final decision. TLMP 2 was totally unacceptable.

Alternatives that invade this river corridor , in addition to adverse environmental impacts are all costly to the U.S. treasury. Access to the timber in Sec. 2 would not compensate for the loss of other values. It is less costly to protect the stream for natural fish production than to build costly "fish enhancement" projects.

I do not consider the fact that forclosure of the Kake-Petersburg road is an adequate reason to reject Section 2 for Wild River classification. There are numerous other reasons this road should not be built.

Thank you for the opportunity to comment on this timber sale proposal.

Sincerely yours,

Dixie M. Baade

Dixie M. Baade

Letter From Dixie Baade

Comment 1: Monitoring will be after the fact and the damage done. What do you about deer winter range, soil damage, and increased pressure on traditional subsistence resources?

Response 1: As stated in Chapter 2, monitoring *is* a process which is done after the fact, to increase knowledge to see if activities implemented were effective. Mitigation, on the other hand, is action or actions taken to avoid or minimize negative impacts of a management activity. Mitigation activities include the Tongass Timber Reform Act (TTRA) minimum 100' buffers on all class I and class II streams that feed directly into class I streams and implementing Best Management Practices (BMP's) (FSH 2509.22 Soil and Water Conservation Handbook). Deer winter range is not gone forever but is altered for a period of time.

Comment 2: "In the absence of logging, are stream stabilization measures necessary in V-notches on Bohemia Mountain?"

Response 2: No. Current conditions in the V-notches on Bohemia Mountain are considered typical of many V-notches in southeast Alaska. Especially considering the difficulty of such operations without adequate access (the no action scenario), it is considered unnecessary and infeasible to attempt any stabilization measures at this time.

Implementation of stream stabilization measures in V-notches in this region is an area of limited trial and error experience. Should they ever be deemed necessary, the main objective of such measures would be vegetation establishment on "raw" slopes. Sometimes the placement of riprap or porous check dams would be required to stabilize the slope long enough for vegetation (natural and planted) to become established. However, such measures are very costly and require careful design. They may even be detrimental to the existing system because the complexity of the system may hide the influence of any number of unknown factors. An erroneously designed and placed structure may adversely affect the channel and only magnify the problem.

Comment 3: "In TLMP I [Tongass Land Management Plan '85-86] sport fish and commercial fish were rated 5 and timber 2. The most valuable resource of the area is fish!"

Response 3: The fisheries and timber ratings made for the sale area in TLMP are still valid today. TLMP designated the sale area as LUD IV. With the protection of Class I and II streams and with best management practices (BMP's) for maintenance of water quality, fisheries habitat within the sale area will be protected.

Comment 4: "Water quality degradation violates State water quality standards."

Response 4: We believe the task of managing the Alaska's waters and maintaining high water quality is a responsibility to be shared by both State and Federal agencies.

The Forest Service has been formally and actively implementing our Best Management Practices (BMP's) since Chapter 10 of the USDA, Forest Service, *Soil and Water Conservation Handbook* (FSH 2509.22) was first issued on January 9, 1990. As a result of our monitoring process design, and in response to changes required by the Tongass Timber Reform Act of 1990, we refined our BMP's on February 26, 1991. Personnel from the State were helpful in assisting us with this ongoing refinement process.

We believe that the primary means for evaluating the effectiveness of BMP's is to determine the degree to which instream water quality meets State Water Quality Standards. However, the Forest Service continues to agree with the EPA statement, found in the introduction of our handbook, that the

> "Proper installation, operation and maintenance of State approved BMP's are presumed to meet a landowner's or manager's obligation for compliance with applicable water quality standards. If subsequent evaluation indicates that approved and properly installed BMP's are not achieving water quality standards, the State should take steps to (1) revise the BMP's, (2) evaluate and, if appropriate, revise water quality standards (designated beneficial uses and water quality criteria) or both."

We will do our best to meet the limits set in the State Water Quality Standards. However, if it becomes clear through monitoring that BMP's are being implemented fully and that all designated beneficial uses of the natural waters are being protected, yet the State Water Quality Standards still are not attainable, then the need for modification of the standards may be indicated.

We aim to work with the State to correct any deficiencies in the State forest practices standards. Our goal is to have the State certify our BMP's--that they are proved as effective or better than the state forest practices. At that time we hope to be granted Designated Management Agency status as described in our current Memorandum of Understanding with the State (signed May 16, 1980). We want and expect our BMP handbook to be fully realized in the field and to become the primary mechanism to assure clean water on National Forest lands in Alaska.

Comment 5: "Is there field data to support or confirm the data in the [wildlife] computer models?"

Response 5: Field verification of the models is ongoing, but as current research becomes available, the models are adjusted, if appropriate. An interagency task force of biologists from the Alaska Department of Fish and Game, U.S. Forest Service, and the U.S. Fish and Wildlife Service developed the models.

They were developed based on published research that often occurred outside of southeast Alaska. An example of this is the joint ADF&G and Forest Service marten research, currently being conducted in southeast Alaska. As a result of first year data, densities projected by the marten model were reduced.

Comment 6: "There will be no chance for deer populations to recover if they lose their winter range."

Response 6: It is important to understand that a particular habitat is not destroyed or permanently lost as a result of timber harvest; rather, the value of that habitat for various wildlife species or groups of species is altered.

In the case of black-tailed deer, winter range value is reduced for a considerable period of time (research estimates 150 years before old-growth characteristics reappear).

Our analysis indicates that even with the reduction in deer habitat capability associated with this proposal, the analysis area will retain over 90% of the winter deer population potential that existed before harvest (Figure 4-1, p. 4-16, Draft EIS)

Comment 7: "Survival of marten should not be linked to whether they are to be trapped. NFMA [National Forest Management Act]requires maintenance of biological diversity."

Response 7: We agree. The trapping data displayed for marten and otter were only to indicate both species' economic value to some southeast Alaska residents. Under all alternatives considered, the survival, (viability) of marten are assured, (Draft EIS, p. 4-12) and potential marten populations are projected to be at least 92% of preharvest levels (figure 4-2, p. 4-17).

Comment 8: "There will inevitably be bear--logging camp conflicts that result in death of the bear. If this is to be a year-round camp there will be hunting and trapping contributing to the decline in deer, bear and marten."

Response 8: People staying in the camp will be required to follow all Department of Environmental Conservation regulations pertaining to solid waste disposal which are designed to minimize bear--logging camp conflicts.

It is possible a year-round camp would be used, and the individuals living there would have the same legal right to the harvest of fish and wildlife as any other private citizen. Harvest limits are set by the Alaska Department of Fish and Game in order to maintain huntable wildlife populations. Subsistence regulations will be in effect and may influence which users have priority.

Comment 9: The Forest Service should recognize the lack of wildlife values in second-growth stands. "This is an outdated attitude ignoring biological diversity and shows lack of recognition of the difference between a tree farm and a forest."

Response 9: We do recognize a decrease in habitat value in second-growth stands for many wildlife species.

The drop in potential management indicator populations displayed in Figures 4-1, 4-2, and 4-3. Pages 4-16 and 4-17 (Draft EIS) are directly related to the conversion of old-growth wildlife habitat to second growth.

The reference you cite concerning second growth productivity refers to timber growth and merchantability and is accurate.

Comment 10: "Show how you will 'enhance wildlife opportunities' in logged over areas."

Response 10: The only wildlife management opportunity identified in the analysis was possibly constructing a wildlife viewing area near the Portage Bay estuary under Alternative 5. This would provide visitors using the Portage Bay recreation cabin and vehicle users between Portage and Kake to have a quality viewing site (similar to the swan observatory on Mitkof Island). That would cause the least disturbance to area wildlife.

Comment 11: "There is a need to identify areas of importance to subsistence. Road access will only increase competition for subsistence resources."

Response 11: Public hearings held in Kake and Petersburg, Tongass Resource Use Cooperative Survey, literature searches, and field verification of wildlife populations demonstrate that the study area is not an important subsistence use area. No written responses to the draft indicated concern by subsistence users about impacts to specific subsistence resources.

Comment 12: "We need to know the volume class 6 to be included in the sale area under the different alternatives, since this is the class of most value to wildlife."

Response 12: Volume per acre for each unit is displayed in each unit description in Appendix F. Table 4-19 of the Draft EIS displays the number of acres that would be harvested by volume class for each alternative. The discussion on page 3-40 of the Draft EIS shows the percent of each volume class in the study area. The Tongass Timber Reform Act does not require that the Forest Service harvest proportionately in independent timber sales.

For a further discussion on old growth, refer to the Wildlife section in Chapter 4.

Comment 13: "There should be a map showing the areas to be logged, the volume classes, and the key winter wildlife habitat."

Response 13: Maps displaying the location of proposed harvest units by alternative are shown in Chapter 2, pages 2-6, 7, 10, 11, 14, and 15. A map showing the key deer winter range can be found on page 3-19. A map showing older-age-class forest blocks can be found on page 3-14.

Comment 14: "There should be a discussion of slope failures (Appendix B) in the period after the roots die. What management practices exist to 'avoid interrupting the natural surface and sub-surface drainage patterns and minimizing disturbance to soil surface?'"

Response 14: There is a period of time from 5-10 years after harvest where oversteepened slopes fail. As part of recognizing this, we do not harvest oversteepened slopes and minimize disturbance to areas with subsurface drainage problems. During cable logging operations, suspending logs partially (forward end of log above the ground) is a very effective practice to minimize disturbance to the soil surface. These practices are commonly applied to areas where disruption of surface or subsurface drainage patterns could result in increased slope instability. These areas are designated on unit cards and on the sale area maps as part of the timber sale contract.

Comment 15: "Recent figures (CHEC) indicate that the Tongass lost over 28 million dollars in 1990. The loss in the Stikine area was over 10 million. I oppose using timber sales as a direct subsidy, a welfare program if you will, to keep the timber industry afloat."

Response 15: The forest timber sale program reporting systems financial report for the Tongass National Forest in 1990 showed a net gain of 9.7 million dollars after an 8.8 million dollar payment to the State of Alaska for roads and schools.

Road construction is the largest single cost item in a timber sale financial analysis. The complete road construction costs are applied to this sale, while in actuality the roads will be used for future timber sales, as well as recreation and forest administration. Alternative 3 shows a positive return because the mainline roads were constructed previously by another timber sale. Future timber sales on Bohemia Mountain will show a positive financial return because of the roads that will be constructed by this timber sale. If we were to amortize the road construction costs for this sale over time, all alternatives would show a positive financial return.

The figures used in the Draft EIS are for comparative use only. The actual selling value of the timber will be determined by bid.

Comment 16: "I am concerned as to whether these so-called 'independent' timber sales can be bid on by ALP or KPC. Should these not be small business set-asides?"

Response 16: At this time, no determination has been made as to whether this will be a small business set aside sale. This determination will be made the year the sale is sold.

Comment 17: There is a concern that if the Kake/Portage Bay road connection is built it will reopen the issue of a possible road connection from Portage Bay to Petersburg and of a state right-of-way conflict in the city of Kupreanof.

Response 17: The right-of-way in question is beyond of the scope of the Bohemia Mountain timber sale analysis. Although it can be viewed as a connected action, it is State land, and therefore a State decision whether or not to connect these communities and where the right-of-way is located. We would suggest contacting the State of Alaska Department of Transportation for further information.

Comment 18: "I see no reason designation of the Duncan Salt Chuck River has to be tied to the Bohemia Mountain timber sale. No logging or road building should be considered in this area until after the TLMP Revision."

Response 18: The suitability study completed as part of this Draft EIS followed the same process which would be used at the Forest Plan Revision level. The amount of detail in the study is the same at either planning level. The study was completed at this time in order to determine how the river might be affected by Tongass Land Management Plan scheduled activities, as listed on p. 98 of TLMP (Amended 1985-86).

City of Kake
"HOME OF THE WORLD'S LARGEST TOTEM POLE"
P.O. BOX 500
KAKE, AK 99830
907-785-3804

June 28, 1991

Tamara S. Malone
IDT Leader
P.O. Box 309
Petersburg, Alaska 99833

Dear Ms Malone:

The proposal that Kake prefers depends upon a long range outlook both economical, subsistence, and recreational access. It is very vital to insure a traditional usage area be maintained in a useful co-existence which meets all of the criteria involved, the Forest Service has taken tremendous strides in preserving, and eliminating habitat problems.

There are several if involved with this sale:

1. A proposed route for a wilderness area by a driven vehicle.

2. Accessed to a wilderness area by a driven vehicle.

3. Health and Medical attention in severe weather conditions for Kake residents.

4. The care, and concern of fish streams, wild life, and etc.

5. The long term benefit to both communities, employment by local Kake residents within the logging operation.

1

We feel that if you go ahead, and put the area in a logging mode that a long range plan be adopted to save extra costs in years to come.

Again, emphasis must be upon preservation of our susistence life style as the top priority. The rest fall in a different area.

2

The greater numbers of citizens that have talked to us propose the number five (5) plan or none at all. Too many times Kake has been pushed aside to satisfy outside interests, so connect the two roads, period.

Sincerely,

Ronnie Anderson, Mayor

Letter from Lonnie Anderson, City of Kake

Comment 1: The City of Kake has several reasons why they believe the Kake/Portage road connection should be built.

1. It would provide road access to the Petersburg Creek-Duncan Salt Chuck Wilderness.

2. In the long run, Kake residents hope to have access to medical facilities in Petersburg.

3. If the road were built, it would provide a better opportunity to construct enhancement projects for fish streams and wildlife habitat.

4. Kake residents could have a better opportunity for employment at the Portage Bay logging camp if they could travel on the proposed Kake/Portage road connection.

Response 1: Although the preferred alternative does not propose to build the Kake/Portage road connection at this time, we have not ruled out this possibility for the future. The mainline road location in the preferred alternative would be on the south side of Duncan Salt Chuck Creek, which is in line for a possible future road tie. We agree that the above benefits would exist for Kake if the road connection were to be built.

Comment 2: "Emphasis must be upon preservation of our subsistence lifestyle as a top priority."

Response 2: Tongass Resource Use Cooperative Survey, ADF&G technical reports, and public hearings and meetings, all demonstrate that subsistence use in the area would not be affected in a negative way by this timber sale.

United States Department of the Interior

TAKE PRIDE IN AMERICA

OFFICE OF THE SECRETARY
Office of Environmental Affairs
1689 C Street, Room 119
Anchorage, Alaska 99501-5126

ER 91/491

RECEIVED
JUL 12 1991
STIKINE AREA
TONGASS NATIONAL FOREST

JUL 8 1991

Ms. Tamara S. Malone, IDT Leader
USDA Forest Service
Alaska Region
Stikine Area
P.O. Box 309
Petersburg, Alaska 99833

Dear Ms. Malone:

In response to your request, we have reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Bohemia Mountain Timber Sale, Stikine Area, Tongass National Forest. We offer the following comments for your consideration:

General Comments

Within the range of alternatives presented in the DEIS, Alternative 3 would have the fewest adverse impacts on the high value fish, wildlife, and habitats of the Stikine area. The Stikine lowlands and adjoining watersheds provide major spring migration and summer waterfowl, shorebird, and raptor staging and nesting habitat. Alternative 3 would affect the lowest number of buffered and unbuffered anadromous fish streams and alter the fewest acres of high value terrestrial wildlife habitat.

Specific Comments

Chapter 3, Page 8, paragraph 2: The Wetlands and Floodplains section notes that approximately 70 percent of the analysis area is classified as wetland according to the soil resource inventory database. The discussion should indicate if the database classification is consistent with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (January 1989). 1

Chapter 3, Page 32, paragraph 1: Because all alternatives other than Alternative 3 would preclude further consideration of the Duncan-Salt Chuck Creek for Wild and Scenic River designation, analysis of this system should be addressed as part of the 2

2

Tongass Land Management Plan, which is currently being revised. Designation of the stream as a wild and scenic river would provide some level of protection for fisheries resources, water quality, and aquatic and riparian habitats. 2 (cont.)

Chapter 4, Page 1, paragraph 4: The EIS should discuss how temporary increases in silt loads in streams and tributaries associated with culvert installation will be timed to occur when anadromous fish are not present and avoid spawning and rearing life stages of resident fish. Also, the document should discuss where stream crossings will be bridged to avoid low water crossings. In erosion-prone areas, use of silt curtains may be necessary. 3

Chapter 4, Page 8, paragraph 4: Increased sedimentation would have adverse impacts on fish and other aquatic life in Duncan-Salt Chuck Creek. We suggest that the statement should be expanded to discuss where roads are expected to cross steep slopes and unstable soils and which erosion control methods will be used. 4

Chapter 4, Page 8, paragraph 8: Where unstable soils areas and steep terrain which necessitate extensive cut and fill construction cannot be avoided, erosion control measures and methods should be identified and addressed in the statement.

Chapter 4, Page 27, paragraph 11: We suggest changing your conclusion that designation of Segment 2 as a wild river would likely not have any significant impact on mineral resources to unknown. Designation of Segment 2 would preclude development of any undiscovered mineral resource that may exist in the river corridor (5,705 acres.) 5

We appreciate the opportunity to review the draft document.

Sincerely,

Paul D. Gates
Regional Environmental Officer
Alaska

Letter from Paul Gates, Department of the Interior

Comment 1: The Wetlands and Floodplains section should indicate if the database classification is consistent with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (January 1989).

Response 1: Data used to clarify wetlands is consistent with the Federal Manual for Identifying and Deliniating Jurisdictional Wetlands (January 1989).

Comment 2: Analysis of Duncan Salt Chuck Creek for Wild and Scenic River designation should be addressed as part of the Tongass Land Management Plan Revision.

Response 2: See Response 18 in the letter from Dixie Baade

Comment 3: "The EIS should discuss how temporary increases in silt loads in streams and tributaries associated with culvert installation will be timed to occur when anadromous fish are not present. Also, the document should discuss where stream crossings will be bridged to avoid low water crossings."

Response 3: The FEIS road descriptions will identify those streams needing timing restrictions on bridge and culvert construction in order to to avoid anadromous fish spawning. The FEIS road descriptions will also identify where bridges are recommended.

Comment 4: "Where unstable soils areas and steep terrain which neccessitate extensive cut and fill construction cannot be avoided, erosion control measures and methods should be identified and addressed in the statement."

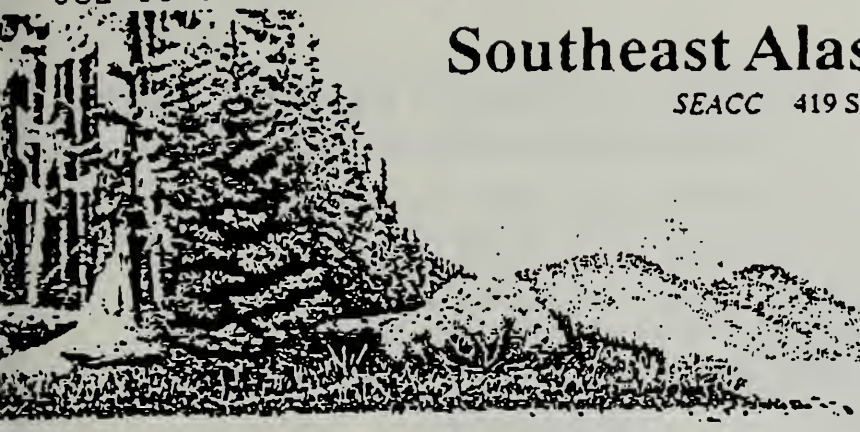
Response 4: Site specific erosion control measures are identified on the road and unit cards in the Final EIS. Areas identified as having the most serious stability and/or erosion problems (rated high soil hazard) have been avoided, that is, no roads or harvest units are proposed in these areas in the preferred alternative.

Comment 5: "We suggest changing your conclusion that designation of Segment 2 as a 'wild' river would likely not have any significant impact on mineral resources to unknown."

Response 5: According to the interpretation of The Wild and Scenic Rivers Act in Forest Service Handbook 1909-12, Section 8-12, standards for Wild Rivers Section e - Mining: New mineral claims are prohibited within ¼ mile of the river. Other existing mineral activities would be allowed to continue. Designation of Segment 2 would preclude development of any undiscovered mineral resource that may exist in the river corridor (5,705 acres)

This area has been described as having a potential for undiscovered mineral resources in the TLMP Revision.

JUL-15-91 MON 11:13



Southeast Alaska Conservation Council

SEACC 419 Sixth Street, Suite 328 Juneau, Alaska 99801 (907) 586-6942

Telecopy
Received ✓ Sent
Date: 7-15-91
Time: 12:26

FAX TRANSMISSION FORM

DATE: 7/15/91

FROM: Buck Finkelnburg

TO: Tamara S. Malone, IDT Leader – Bohemia Mtn Timber Sales

RECIPIENT'S FAX NUMBER: 772-3314

NUMBER OF PAGES INCLUDING THIS SHEET: 10

MESSAGE: Tamara – These are SEACC's comments on the DEIS for the Bohemia Mtn. Timber Sale. The original is being sent via regular mail.

Buck

Southeast Alaska Conservation Council

SEACC 419 Sixth Street, Suite 328 Juneau, Alaska 99801 (907) 586-6942

July 15,1991

Tamara S. Malone
IDT Leader
P.O. Box 309
Petersburg, Alaska 99833

Dear Ms. Malone:

Thank you for the opportunity to comment on the Bohemia Mountain Timber Sale Draft Environmental Impact Statement (DEIS). Please include the following comments in the official planning record.

It is our opinion that this timber sale is premature in view of the fact that the Tongass Land Management Plan Revision (TLMP) is not yet complete. The current Forest Plan fails to provide sufficient direction regarding important management requirements such as maintaining viable wildlife populations and avoiding significant restrictions to customary and traditional subsistence resource use areas. The current Forest Plan also fails to adequately meet the needs of resource based industries other than timber and provide for non-commodity uses of forest resources for subsistence and recreation as required by the Tongass Timber Reform Act. Therefore, timber supply decisions and commitments on north Kupreanof Island should be deferred until completion of the revision. 1

The following is a list of issues that SEACC feels need more careful analysis. The following issues should be addressed in the final impact statement for the Bohemia Mountain timber sale.

The connecting road between road 6030 and the Portage Bay road should not be constructed.

The Portage Mountain Loop Trail is one of the most important recreation features in the area. It is the longest trail in the area and is unique in that the entire trail can be hiked without carrying a tent. By utilizing the Forest Service Cabins at Petersburg Lake, Portage Bay, and the Duncan Salt Chuck, hikers can spend three days in this roadless natural area. As the tourism industry of Alaska expands, this area will prove to be of vital importance to the local economy. The severing of this trail will 2

decrease it's value tremendously.

The DEIS states that the construction of this road will directly affect 160 acres of LUD II land which includes the Duncan Salt Chuck. As part of the definition of LUD II land it states that "Roads will not be built except to serve authorized activities such as vital forest transportation system linkages when no other feasible land or water routes exist". Since there is a land route from the study area to Kake, complete with log dump, no necessity exists for constructing a new road through LUD II land. The completion of a connector road will save only approximately six miles of hauling to Portage Bay rather than to the log dump south of Kake. In addition, the road is planned for construction through low lying wetland area. This area is important nesting, resting and feeding habitat for bird species such as Canada Goose. The road corridor infringes on several small inland lakes and ponds important to these birds. Such a road will be very expensive and will adversely affect a fragile area. 3

The construction of a road between Kake and Portage Bay would link Kake to within 12 miles of the communities of Kupreanof and Petersburg. Although the Forest Service has continually denied any interest in linking these communities, continual references are made to the topic in the DEIS. Residents of Kupreanof, Petersburg, and many residents of Kake are already on record as opposing such a connection.

In summary, this road should not be constructed because it will cause major damages to an important and valuable recreational trail system. The road will also create unnecessary impacts to LUD II land.

The preferred alternative locates most of the timber sale units in the highest value deer winter range, particularly around Bohemia Mountain.

The Portage Bay area was once a popular deer hunting spot for the local population of Petersburg. With the deer population on the increase, it will prove to be an important hunting area again in the future. Due to almost complete devastation of deer winter range around the community of Kake, it will be an important hunting area for Kake people as well. Because there is relatively little deer winter range in the Bohemia Mountain area, and because it takes over 100 years for suitable winter browse to regrow in logged areas, deer winter range should be avoided completely in the logging plan, not targeted for cutting as it is in this DEIS. 4

Subsistence Hunting of deer in the DEIS study area has not been adequately analyzed.

Much of the northern end of Kupreanof Island was closed to deer hunting in 1975 due to abnormally low populations of deer. It is wrong for the DEIS to assume that all subsistence hunters have shifted their deer harvests to other areas. Many may have stopped hunting because no areas close to home are open. The DEIS implies that this area is no longer important for subsistence. It is not proper to analyze the subsistence harvest possibilities in an area with only a couple of years data. Subsistence use in any given area can change greatly from year to year. With deer populations increasing on Kupreanof Island, it is likely that this area will be an important subsistence use area in the near future.

The Forest Service fails to consider the effects of poaching on the deer population in the sale area. All roads, and most especially the Kake-Portage Bay Road, would increase the "unknown risk" of poaching in the sale area. The Forest Service needs to consider this risk in evaluating the impacts from constructing the Kake-Portage Bay Road on subsistence deer hunting in the sale area. 5

The Forest Service should screen all significant streams and rivers within VCUs 424, 441, and 442 to determine if streams therein possess significant resource values to be considered as part of the national rivers system.

SEACC believes that several rivers within the Bohemia Mountain Timber Sale study area should be considered as candidates for adoption into the national rivers system. Such beliefs are based on observations contained in the VCU Matrix, Appendix III, Tongass Land Management Plan, Final Environmental Impact Statement, Part 1, March 1979.

The VCU Matrix assigned VCU 441 the highest ranking for primitive recreation, sports fisheries, commercial fisheries and estuarine sensitivity. VCU 424 received the highest possible ranking for both sport and commercial fisheries. VCU 442 received the highest ranking for estuarine activities, and second highest ranking for primitive and semiprimitive recreation, commercial fisheries and supplementary wilderness values. This information strongly suggests that several rivers and streams within this watershed possess outstandingly remarkable values which should be identified, analyzed, and evaluated. Under section 5(d) of the Wild and Scenic Rivers Act, the Forest Service has an obligation to consider potential national wild, scenic, and recreational river areas in every planning effort for the use and development of forest resources. 6

The entire 10 miles of the Duncan Salt Chuck Creek should be classified as a wild and scenic river.

Duncan Salt Chuck Creek is located on Kupreanof Island. The creek is ten miles long, six miles of the creek are located in the DEIS study area and the remainder is located in the Petersburg Creek-Duncan Salt Chuck Wilderness Area. Duncan Salt Chuck Creek originates from a lake at 1000 feet elevation and flows ten miles to the Duncan Salt Chuck. The stream is prime habitat for steelhead trout, silver salmon, and cutthroat trout. It has been classified as a Class I salmon stream. Page E-111 of the Tongass Land Management Plan (TLMP) Revision, Appendix, Volume II (Draft, June, 1990), states that "Duncan Salt Chuck Creek has outstandingly remarkable fish, recreation, wildlife, historic, and scenic values of national significance because of a combination of high values". In addition, the Alaska Department of Fish and Game has listed the Duncan Salt Chuck Creek among the 19 high value watersheds of Southeast Alaska. The Duncan Salt Chuck, located at the terminus of the stream has been nominated as a Research Natural Area. We Support the TLMP revision's (DEIS) alternative A which recommended that the entire Duncan Salt Chuck Creek be designated as a wild river.

As mentioned above, section 5(d) of the Wild and Scenic Rivers Act, stipulates that the Forest Service has an obligation to consider potential national wild, scenic and recreational river areas in planning for the use and development of forest resources. By failing to consider potential impacts of downgrading the Duncan Salt Chuck Creek from "Wild" to "Scenic" the DEIS is inadequate. In particular, no logging or road construction should be authorized within the study corridor of the creek before the Duncan Salt Chuck Creek's potential for designation under the Wild and Scenic Rivers Act is fully considered in an adequate EIS.

The Forest Service Handbook establishes procedures for identifying and evaluating potential additions to the National Wild and Scenic Rivers System. FSH 1909.12, Ch. 8. The Handbook specifically states that rivers identified for study for inclusion in the system should be managed to ensure protection of the area's outstandingly remarkable values and to ensure that development activities do not occur which would affect the river's eligibility or classification. FSH 1901.12 at 8.12. The Handbook confirms what is clearly required by NEPA: the agency must take no action which forecloses consideration of proposed alternatives before a decision is made.

Thus, until the TLMP revision planning process is complete, the Forest Service can take no action which would compromise the potential designation of the Duncan Salt Chuck Creek. In other words, the Forest Service may not authorize a road through the river corridor, or authorize actions outside the corridor that will degrade the area's visual quality, or in any way compromise the

7

area's outstandingly remarkable values (ie., primitive recreation, scenic, wildlife and fisheries). This protection must last until the rivers' suitability for wild and scenic status has been studied and conclusively determined. Importantly, this determination is one to be made in the context of a completed river study, not before a study is done or while one is in progress. This study must be performed by an interdisciplinary team appointed by the Forest Supervisor. FSM 1924.04d (WO Amend. 1900-91-2)(March 11, 1991). 7 (cont.)

The Duncan Salt Chuck Creek is a study river, a determination of suitability has been made, and further studies are required. The challenged activities would degrade the outstandingly remarkable values in the river corridor and surrounding visual corridors. The proposed cutting units in VCU 424 are in close proximity to the river corridor and within the visual corridors. Regardless of whether this segment is classified as "wild" or "scenic", the Handbook requires special emphasis to be given to maintaining visual quality. FSH at 8.2(1)(a) and (2)(a). Because the agency considers the scenic values of the Duncan Salt Chuck Creek area to be "outstandingly remarkable", the units considered in VCU 424 must, at a minimum, be subject to the most restrictive VQO available (ie., "Preservation"). 8

Additional segments of road 6030 should not be constructed.

The DEIS outlines two alternatives for the location of an additional segment of collector road 6030 that parallels the gorge of Duncan Salt Chuck Creek. They are referred to as the south route and the north route. The explanation of roads is very unclear in the DEIS. Maps and clear explanations of road locations should be provided to better understand road alternatives. 9

The south route is planned to be located near the top of the ridge that parallels the creek to the south. The included maps in the DEIS, which are of very poor quality, show that the south route does not access timber sale units. It is not clear why this option is even being analyzed. The construction of the road would require the placement of two bridges over the Duncan Salt Chuck Creek. If the Duncan Salt Chuck Creek receives the proper designation as "Wild" it would render the construction of these bridges illegal. No plans to locate these bridges should even be considered until final designation of the stream is completed in the Tongass Land Management Plan Revision. 10

The proposed northern route is to be located on the south face of Bohemia Mountain, paralleling the Duncan Salt Chuck Creek to the north. The north route will cross 5 deep V-notches and the DEIS states that it will also cross the Duncan Salt Chuck Creek itself. The included maps do not, however, show this road crossing the creek. The soils located in the area of the southern face of 11

5

Bohemia Mountain have been designated as high hazard soils due to the location of steep V-notches incised in blue clay deposits. The construction of a road on blue clay deposits in steep gorges is ludicrous. The DEIS states that the road will present "serious instability and soil erosion problems" which would create sedimentation stress within the creek. The DEIS states that "despite the potentially serious soil hazard, a mainline road is feasible...", but does not explain how it would be feasible, except to say that "the road can be located on gentle topography which will not require extensive or deep cut and fill slopes in this unstable soil material". The DEIS fails to show, however, the location of "gentle topography" upon which the road will be constructed. The document also states that "any slides or slumps in the analysis area are expected to recover relatively quickly". However, the document does not outline what affect slides, slumps, and sedimentation will have on the salmon and trout populations within the Duncan Salt Chuck Creek, a Class I salmon stream. Moreover, the Forest Service can not approve any activities which are likely to cause violations of state water quality standards. Again, if this river receives a designation of "Wild" it will render the construction of a bridge over the Duncan Salt Chuck Creek illegal. This road should not be built. 11 (cont.)

The sale on the north end of Kupreanof Island is along a highly scenic route for boat travellers.

The DEIS shows a map on page 4-39 which indicates that the majority of the timber sale units are located in "sensitive seen areas". The state ferry, several cruise ships, commercial fisherman, and private boaters alike will be adversely affected by this highly visible sale. 12

The preferred alternative appears to have been selected solely on the basis of maximizing timber harvest. Selection criteria must include non-timber resource values.

The DEIS does not adequately explain why it chose Alternative 5A as the preferred alternative. The only justification for the selection of the alternative is that it provides the greatest volume of harvest. Why should the greatest volume of timber harvest be favored over a smaller volume alternative that is less damaging to other resource values? Classification of an area as LUD IV means that logging is allowed to take place, it does not mean that logging is the preferred alternative or highest and best use of the area. In the absence of a discussion of how the alternatives were formulated in the first place, and how a decision was arrived at, selection of the preferred alternative appears to be based solely on timber extraction. This kind of decision making process fails to meet the National Forest Management Act multiple 13

use standards.

Such a decision also violates the Tongass Timber Reform Act (TTRA). Section 705(a) of ANILCA, as amended by the TTRA, requires that timber sale offerings must not be in excess of actual market demand. The net effect of Section 705(a), as amended, is to assure that clearcutting timber in the Tongass is not given a priority over other uses of the forest. Furthermore, the DEIS lacks any analysis supporting the conclusion which is implicit in the agency's selection of Alternative 5A, that approving a timber sale totalling 34 MMBF is necessary to meet current market demand. The omission must be corrected. 14

Fragmentation of old-growth timber tracts, as described in the preferred alternative (5A), and alternatives 4 and 5, is unacceptable.

The Forest Service states that the maintenance of old growth tracts is a New Perspectives element. However, alternatives 4, 5, and 5A all propose maximum fragmentation within the study area. What kind of doublespeak is this? 15

Fragmentation is also unacceptable from a wildlife standpoint. The Forest Service is required to manage the Tongass as a multi-use forest. Insufficient analysis has been done or presented on the effects that fragmentation will have on wildlife habitats.

The DEIS fails to conduct an adequate Cumulative Impact Analysis.

It is essential that the DEIS analyzes the affects of past, present, and future impacts on the area. This should be completed in detail in the Final Environmental Impact Statement. 16

DEIS Alternatives 2, 4, 5, and 5A yield deficit timber sales.

The above mentioned alternatives return between -$29/MBF and -$111/MBF. The preferred alternative (5A) returns -$54/MBF or -$64/MBF depending on the location of the road. Only alternative 3 returns money into the treasury. 17

Wildlife population analysis are inadequate.

Pages 4-16 through 4-18 show tables in which the cumulative effects on deer, marten, black bear, river otter, and bald eagle are depicted by alternative. The table titles imply these are actual population numbers. That is incorrect. A more thorough 18

7

investigation of current wildlife populations in the study area must be conducted. Bald eagles, for instance, should be relatively easy to census.

Page 4-16 refers to the use of habitat suitability models to develop these tables. These models were developed with the Alaska Department of Fish and Game (ADF&G). Page 4-16 states that some of the model outputs were "corrected". Was ADF&G consulted before "corrections" were made? 19

Retention for wildlife habitat should be in addition to that proposed in the DEIS.

We are pleased to see beach fringe, estuaries, and streamside habitats earmarked for wildlife habitat and proposed for retention. Retention of these areas should be made permanent, however, and not to apply only to this logging entry. We view these retention areas as the bare minimum that should be adopted by the Forest Service. Proper concern for fisheries, wildlife, recreation, water quality, and other resources of the forest should protect beach fringe, estuaries, and streamside forest as a matter of course in all timber sales. Again, wildlife habitat retention should be in addition to that proposed in the DEIS. 20

The DEIS fails to outline percentages of volume class timber to extracted under each given alternative.

Page 3-40 of the DEIS outlines the percentages of class 6 (high volume), class 5, and class 4 (low volume) timber stands in the commercial forest land. However, the DEIS includes no site-specific information or maps on timber volume classes in the study area. In addition, the document does not outline the percentage of timber within each volume class that would be harvested under each alternative. This information is necessary for the public and Forest Service to make an informed decision on this sale. Moreover, such information is required to determine if the Forest Service has ended it's practice of allowing high-grading to occur in the Tongass. 21

The DEIS does not contain a map of old growth blocks.

It is impossible to determine the Forest Service commitment to save percentages of old growth without a location map. In addition, it is difficult to analyze important habitat areas for wildlife such as the pine marten. Without a clear understanding of old growth blocks left intact, it is impossible to make any statements on the vitality of animals such as the pine marten, which depends on old growth for winter range. 22

The Wilderness section on page 2-16 is incorrect.

The wilderness section on page 2-16 refers to the effect that alternative 3 will have on wilderness. However, the discussion on page 2-16 pertains only to alternative 5A. 23

In order for the Forest Service and the public to make responsible decisions on the future plans for the Bohemia Mountain area, the above mentioned issues should be addressed and analyzed in detail. Again it is SEACC's opinion that this sale will be premature until the Tongass Land Management Plan Revision is complete and wild and scenic designations are analyzed in detail within the study area. Until the Forest Service conducts a proper study on the Bohemia Mountain area, SEACC will oppose any timber sales in this area.

Sincerely,

Glenn Mitchell
Environmental Engineer

Buck Lindekugel
Staff Attorney

9

Letter from Glenn Mitchell and Buck Lindekugel, Southeast Alaska Conservation Coalition

Comment 1: "The current forest plan fails to adequately meet the needs of resource-based industries other than timber and provide for non-commodity uses of forest resources for subsistence and recreation as required by the Tongass Timber Reform Act. Therefore, timber supply decisions and commitments on north Kupreanof Island should be deferred until completion of the revision."

Response 1: The ID team does have direction other than the Tongass Land Management Plan. *The Subsistence Management and Use Handbook (FSH 2609.25)* provides guidelines, outlines authority, objectives, policy, responsibility, and definitions to be used when dealing with subsistence issues. The Tongass Timber Reform Act does govern forest activity, even though it postdates TLMP. The ID team is also directed by ANILCA, Title 8, which is legislative direction. Additionally, many fish and wildlife protection measures that will probably be part of the TLMP revision were incorporated in this timber sale, in anticipation of upcoming changes. To assume that the TLMP Revision would change any of this direction is erroneous.

Comment 2: "The Portage Mountain Loop trail is one of the most important recreation features in the area. . . .As the tourism industry of Alaska expands, this area will prove to be of vital importance to the local economy. The severing of this trail will decrease its value tremendously."

Response 2: We understand your concerns about the road connection between road 6030 and the Portage Bay road. In our analysis, we looked at a range of alternatives including the one with the road connection and five without the connection. A number of people have commented that they are in favor of the road connection, so we included it in our analysis. The preferred alternative does not include the road, but it does not preclude future construction, either.

Building the road connection would not eliminate but would alter the recreation experience on the Portage Mountain Loop Trail. The trail would cross the road in two places, creating road access to the trail and providing the hiking opportunity to more people. It would create a unique recreation opportunity in southeast Alaska by having a wilderness (Petersburg Creek-Duncan Salt Chuck Wilderness) accessible by trail, road, and ferry. The tourism opportunity you mention as being important to the area could then be greatly enhanced.

Comment 3: Construction of the Kake/Portage road connection will directly affect 160 acres of LUD II land and will go through a low-lying wetland area.

Response 3: If the road were to go through this LUD II area, it would have an impact on some wetland. The road would, however, avoid estuarine areas. The current TLMP LUD II designation states "this designation will exclude roads, except for specifically authorized uses." It may be determined that the Kake/Portage road connection is a vital transportation link for administrative uses and to provide additional recreation, for example. One beneficial result would be the only wilderness in southeast Alaska that is accessible by road (via the Portage Mountain loop trail). This would provide a unique opportunity in southeast Alaska for many visitors from out of state.

Comment 4: "The preferred alternative locates most of the timber sale units in the highest value deer winter range, particularly around Bohemia Mountain."

Response 4: See Response 6, letter from Dixie Baade.

Comment 5: "It is not proper to analyze the subsistence harvest possibilities in an area with only a couple of years' data. Subsistence use in any given area can change greatly from year to year. With deer populations increasing on Kupreanof Island, it is likely that this area will be an important subsistence use area in the near future."

Response 5: Tongass Resource Use Cooperative Study information, along with Goldschmidt and Haas' study ("Possessary Rights of the Natives of Southeast Alaska") and ADF&G technical reports provide data on past and present subsistence use of the area. While we agree that communities can and have shifted their patterns of use, all available sources have demonstrated that the area has not been important for subsistence use of deer.

If the State were to determine that poaching is a serious concern, ADF&G would work in conjunction with the Forest Service to handle the situation as need warranted, through such measures as road closures and law enforcement. Additionally, if populations increased to huntable levels, ADF&G and Forest Service personnel would work together to manage subsistence and/or sport hunting.

Comment 6: The Forest Service should screen all significant streams and rivers within VCU's 424, 441, and 442 to determine if streams therein possess significant resource values to be considered as part of the national rivers system.

Response 6: This was already done. In September 1989, a team of specialists was given the task of assessing all the rivers on the Tongass National Forest for tentatively eligible status. Eight outstandingly remarkable values were evaluated and the applicable ones "assigned" to each eligible river. Tongass-wide, 112 rivers were identified. In these three VCU's, Duncan Salt Chuck Creek was the only one identified as being tentatively eligible. A suitability study has been or will be completed on each river to determine whether or not the river is suitable and should be recommended for inclusion in the national wild and scenic river system.

Comment 7: Duncan Salt Chuck as been identified as a river with outstandingly remarkable resource values, and the Forest Service should take no action which would compromise the potential designation of the Creek.

Response 7: We agree that the Forest Service did state in the Tongass Land Management Plan Draft Revision (June 1990) Volume II, Appendix E, that "Duncan Salt Chuck Creek has outstandingly remarkable fish, recreation, wildlife, historic, and scenic values of national significance because of the combination of high values." These values are associated with making the river tentatively eligible for Wild and Scenic River consideration. The suitability study completed in the Draft EIS revisits the outstandingly remarkable values associated with eligibility. The river was divided into two segments for the suitability study. The historic value was dropped as an outstandingly remarkable value. The other values were found to be mainly associated with segment one and the salt chuck within the Wilderness. (See Appendix E.)

The comment suggests that "until the TLMP revision process is complete, the Forest Service can take no action which would compromise the potential designation of Duncan Salt Chuck Creek." However, the study was done using the same process and with the same level of detail as would have been used had it been completed for the TLMP Revision. (See also Response 6, above and Response 8, below.)

Comment 8: "The Duncan Salt Chuck Creek is a study river, a determination of suitability has been made, and further studies are required. The challenged activities would degrade the outstandingly remarkable values in the [Duncan Salt Chuck] river corridor and surrounding visual corridors. The proposed cutting units in VCU 424 are in close proximity to the river corridor and within the visual corridors. Regardless of whether this segment is classified as 'wild' or 'scenic', the Handbook requires special emphasis to be given to maintaining visual quality....Because the agency considers the scenic values of the Duncan Salt Chuck Creek area to be 'outstandingly remarkable', the units considered in VCU 424 must, at a minimum, be subject to the most restrictive VQO available (ie., 'preservation')."

Response 8: The first statement in this comment is incorrect. The study on Duncan Salt Chuck Creek is completed. The preliminary designation of "eligible" led to the suitability study. During the summer of 1990, the Bohemia interdisciplinary team walked the length of Duncan Salt Chuck Creek to inventory the outstandingly remarkable values. As a result, a suitability report was prepared (see Appendix E). As this report states, the scenery viewed from the creek which is considered outstandingly remarkable is associated with Duncan Salt Chuck. This outstanding scenery was one of the resources recognized when the Petersburg Creek - Duncan Salt Chuck Wilderness was designated. The present wilderness boundary encompasses and protects the outstanding scenery which makes the Salt Chuck special.

Views from the river along segment 2 outside the wilderness boundary are primarily limited to the immediate foreground within the river corridor. This is particularly true where the river passes through a deep canyon along the base of Bohemia Mountain. It is highly unlikely that timber harvest on the mountain would be seen from the river in this canyon. Harvest activities would be visible from the lakes which flow into Duncan Creek. These units would be viewed in the middleground and background distance zones (1/2 mile and greater), outside the river corridor.

Scenery which is viewed outside the river corridor and which is not of outstandingly remarkable value need not necessarily receive the same level of resource protection as that with outstandingly remarkable values or within the river corridor. A variety of management options are available for lands adjacent to the river corridor, depending on the recommended designation. These management options range from visual quality objectives (VQO's) of "preservation" to "modification" for scenic rivers. The current preferred alternative recommends "scenic" designation for segment 2. For a scenic river, management options for areas outside the river corridor range from VQO's of "preservation" to "modification". In this situation where river segment 2 receives low recreational use, it is in a LUD IV management area, the adjacent lands are of common or minimal landscape variety, and where no outstandingly remarkable scenery is threatened, timber harvest to the extent of meeting a VQO of "modification" would not be incompatible with a scenic river designation.

Comment 9: The explanation of the south and north routes is very unclear in the DEIS. Maps and clear explanations of road locations should be provided to better understand road alternatives.

Response 9: We agree that the maps, at the scale displayed in the DEIS, were not very helpful in displaying the north/south roading alternatives. The FEIS will display the recommended mainline road location in the road description (Appendix G).

The south route has been chosen as the preferred location to reduce the total environmental impacts of roading the north side with a mainline haul road. The alternatives were not adequately displayed and have been corrected in the FEIS.

The upper reaches of Duncan Salt Chuck Creek, where one of the bridges would be necessary, were inadvertently omitted from the DEIS maps. This has been corrected in the FEIS.

Further reconnaissance revealed the infeasibility of constructing a mainline haul road on the south slope of Bohemia Mountain. Consequently, the preferred mainline haul route will not be located through this V-notch complex, but instead will be located on the south side of Duncan Salt Chuck Creek. Lower standard roads will be used to provide access to the proposed timber sale units on the north side of Duncan Salt Chuck Creek. This will allow greater latitude in locating these roads on stable benches, providing access to less hazardous V-notch crossings.

Comment 10: The road locations are not adequately explained and should be delayed until a designation decision on Duncan Salt Chuck Creek.

Response 10: See Response 9, above, and Responses 7 and 8, above.

Comment 11: The proposed northern route is unacceptable.

Response 11: The north route has been changed, see Response 9, above.

Comment 12: "The sale on the north end of Kupreanof Island is along a highly scenic route for boat travellers...The state ferry, several cruise ships, commercial fishermen, and private boaters alike will be adversely affected by this highly visible sale."

Response 12: A number of the proposed units would be visible from Frederick Sound, some for a long distance. Immediately after harvest when color contrast is greatest, some units would likely be easily noticed from as far away as Farragut Bay and Highland Point. As the units revegetate and become green (5 to 10 years after harvest), the units would become less visually dominant. From a distance of 3 miles or more, the color difference would be minor or unnoticeable, but unit shape may be evident as shadows cast by the unit edge. This "phase" in the visual recovery of the unit lasts the longest (35 to 45 years), and so is the time when the greatest number of people would see the unit. Unit shape is usually the most noticeable visual feature. Timber harvest has occurred and is visible on adjacent lands, and so is not an unusual intrusion into a traveler's visual experience. The area is designated for timber harvest. If harvest is to occur, it cannot be completely hidden. It can only be shaped to be as compatible with the landscape and land use designation as possible.

When units were designed on the north face of Bohemia Mountain, they were placed as low on the mountain as possible so that portions of the units would be screened by trees left downhill. Unit boundaries on the uphill side were designed to avoid square shapes or unusual patterns for units 514, 515, 516, and 519. In the case of unit 520A, field work between DEIS and FEIS indicated the unit needed to shift uphill to gain access to merchantable volume. As a result, the unit would be much more visible. In order to achieve an acceptable post harvest appearance, unit 520A was reduced in size by approximately 42 acres. Unit 517A was dropped between DEIS and FEIS due to unmerchantable volume. This will also help reduce the cumulative visual affects of harvest.

When rock pit sites are to be located and designed for entry, their appearance from Frederick Sound will be considered. Visual impacts associated with rock pit development would be mitigated by screening the rock pit with adjacent trees or topography, or facing the pit so it would not face directly on to Frederick Sound.

Comment 13: The preferred alternative appears to have been selected solely on the basis of maximizing timber harvest. Selection criteria must include non-timber resource values.

Response 13: This area is currently designated LUD IV, which provides for commodity uses. Normally, in the first entry we try to remove 1/3 of the operable commercial forest land (CFL). The preferred alternative proposes to remove approximately 6% of the operable CFL. Over the rotation (100-120 years) all operable CFL not set aside for retention is anticipated to be harvested. Based on this removal schedule and re-entries of similar size (30-35 MMBF) every 20-30 years, we are well within the allowable harvest rate in the study area and are spreading the impacts out for other resource concerns.

Currently, all available volume on the Stikine Area has been purchased. Demand for timber is high. Letters received from Alaska Pulp Corporation, Ketchikan Pulp Corporation, and estimates in the TLMP Revision show that demand is in excess of what we are providing.

Although we are analyzing Alternative 5A as the preferred alternative, a decision will not be made until the Record of Decision is completed; it may change based on public comments. Detailed analysis demonstrates that the Forest Service has provided sufficient protection of other resources. While timber volumes may seem high, there is still much forested land that remains and will provide protection of other resources.

Clearcutting is not given a priority over other uses. This sale, for instance, will provide additional access to other areas such as a wild and scenic river corridor, additional recreation, and subsistence opportunities, and areas where we may want to implement fisheries and wildlife enhancement projects.

Comment 14: Timber sale offerings must not be in excess of actual market demand.

Response 14: See Response 13, above.

Comment 15: "Fragmentation of old-growth timber tracts, as described in the preferred alternative (5A), and alternatives 4 and 5, is unacceptable."

Response 15: As you correctly point out, the Forest Service is a "multiple-use" agency and as such, we are required to consider and analyze a full range of management options.

The Bohemia Analysis area is included in a land use designation IV, that emphasizes commodity or market resources. In this area, timber management is the primary opportunity.

New perspectives is a concept or pathway to better deal with issues such as biological diversity, fragmentation, and old-growth forests. We are committed to new perspectives and feel that many of the concepts of "new forestry" have been incorporated into the proposal. Examples include maintaining a diverse group of wildlife habitats such as beach, estuary and interior old-growth blocks that are linked by riparian travel corridors. (See Map 3-7 Final EIS). Additional fragmentation of east Portage by roading would be avoided because of helicopter logging on the unroaded portion. A great deal of effort and planning was given to retaining older-age class green trees in proposed cutting units. This will provide the structural diversity and age distribution necessary for the harvest unit to provide better habitat in the future. More green tree retention was considered, but determined infeasible because windthrow is such a problem in this area.

Comment 16: "The DEIS fails to conduct an adequate cumulative impact analysis."

Response 16: Reasonable foreseeable actions for this analysis area are interpreted to be those that will occur during the Stikine Area 10-year timber sale schedule. At this time, no harvest activities beyond the Bohemia Mountain Timber Sale are planned. We believe the document does sufficiently analyze past, present, and reasonably foreseeable future impacts.

Comment 17: "DEIS Alternatives 2, 4, 5, and 5A yield deficit timber sales."

Response 17: See Response 15, letter from Dixie Baade.

Comment 18: The table titles on pages 4-16 through 4-18 are mislabled.

Response 18: Concur. The titles have been changed.

Comment 19: "Page 4-16 states that some of the ADF&G model outputs were 'corrected.' Was ADF&G consulted before 'corrections' were made?"

Response 19: The statement that "corrections were made to incorporate these field observations into the analysis" has been incorrectly interpreted to imply that model values or assumptions were changed. This was not the case. The corrections were, in one case, to reflect the failure of the otter model to run as designed, and in the other to incorporate past surveys and opinions of ADF&G and other biologists that felt a particular area like the Frederick Sound shoreline was higher value winter deer habitat than our winter deer model was projecting.

In neither case were the models themselves changed. The only change was to correct the computer error in the otter model program in order to more accurately reflect what was found in the field.

Comment 20: There should be more wildlife habitat maintained than that proposed in the DEIS.

Response 20: We feel we have more than met the wildlife habitat requirements prescribed in the Tongass Land Management Plan. Over seven times the acreage required under retention factors was deferred from harvest or roading under all alternatives. Included in this total was all beach fringe and estuarine fringe habitat.

Permanent allocation of lands to management other than those prescribed in the current forest plan must be accomplished through a Forest Plan revision or amendment.

Comment 21: The DEIS does not include site-specific information on timber volume classes in the study area. Further, it does not outline the percentage of each volume class to be harvested under each alternative. Moreover, such information is required to determine if the Forest Service has ended its practice of high-grading to occur in the Tongass.

Response 21: See Response 12, letter from Dixie Baade.

Comment 22: "The DEIS does not contain a map of old growth blocks."

Response 22: Map 3-7 displays old growth in the study area.

Comment 23: The wilderness section on page 2-16 is incorrect.

Response 23: Concur. The wilderness section on page 2-16 should read "Alternative 5A would cause no impacts. . ." It is corrected in the final.

Box 556
Petersburg, AK
July 6, 1991

Pete Tennis, District Ranger
Petersburg Ranger District
P.O. Box 1328
Petersburg, AK 99833

Dear Mr. Tennis:

It seems a foregone conclusion that logging must occur in the Bohemia Range on Kupreanof Island; another beautiful area of the Tongass is on the chopping block to serve the demands of more jobs and increased economic demands. Will the Forest Service ever consider values above and beyond jobs and or the economy, i.e. the beauty and value of an untouched ecosystem that serves the needs of all creatures and the health of our planet. 1

One interesting fact is that road a was built 10 years ahead of the sale to improve the economics for the independent purchaser. The Forest Service has built roads 10 years before the sale to encourage private industry. If private industry needs such encouragement, I wonder about the economic viability of the logging industry. 2

The Forest Service has identified 5A as the preferred alternative. This alternative is one step down from the most intrusive althernative. Alternative 1 shows that zero timber jobs would be generated; it also shows that habitat capability is maintained. Everything is still in place, still viable for the myriad forms of life which the Forest Service must consider valueless, since it recommends 5A. 3

Alternative 2 is listed as the Biodiversity Alternative and sounds more in keeping with the New Perspectives which the Forest Service is promoting. Yet it is not recommended; too many jobs would be lost and there is too much pressure for economic growth in this country. We assume we can grow and grow; other countries have instituted a slow down but we have not yet realized that our resources and our trees are a finite resource.

The Forest Service talks about 50 or 100 year rotations. We continue to think in human terms, as if humans were the only creatures worth considering. What about 500 year cycles, which are nothing in the life of a forest? When will the Forest Service promote biodiversity and not just economics? Has the Forest Service taken note of what has happened in other areas of the Earth when forests are pared to their minimum? The forests in the Alps are unable to sustain themselves; too much human encroachment can weaken a system 4

beyond its power to maintain itself. The Tongass is huge but fragile; by the time the Forest Service recognizes its fragility, the Tongass will only be a tree farm, which may be what it wants.

If the Forest Service were able to step back and consider all sides of an issue, with Biodiveresity given more than a name, we could have small amounts of land for logging that would not destroy the forest at such an alarming rate. The present rate of logging can not continue long; this "crop rotation" idea is not swallowed by everyone. Please allow biodiversity to be more than an idea and do not permit such wholescale trampling of our beautiful forest.

4 (cont.)

Sincerely,

Victoria McDonald

Letter from Victoria McDonald

Comment 1: "It seems a foregone conclusion that logging must occur in the Bohemia Range on Kupreanof Island."

Response 1: Yes, this area has been designated land use designation IV. According to the current Tongass Land Management Plan, (Amended 1985-86) "opportunities will be provided for intensive resource use and development where emphasis is primarily on commodity or market resources." This area is scheduled for a proposed sale in 1992 (p. 98). In the planning process we have worked to provide sufficient protection to other resources and have not planned to harvest the quantity of timber allowed. Our agency's mission is to manage for multiple use on the land. To do so, we have incorporated biodiversity and limited fragmentation by maintaining older-aged forest blocks (Map 3-7).

You refer to the beauty and value of an untouched ecosystem. Approximately 1/3 of the Tongass National Forest is designated as wilderness, national monuments, and LUD II areas which allow the land to be left in its natural state and provide for fishing, hunting, trapping, and recreation.

Comment 2: "The Forest Service has built roads 10 years before the sale to encourage private industry. If private industry needs such encouragement, I wonder about the economic viability of the logging industry."

Response 2: Road construction is the biggest single cost item in the development of the National Forest. The existing portion of road 6030 was constructed in 1984, funded by Tongass Timber Supply funds to provide not only access to low volume timber, but also multiple use access to the National Forest.

Comment 3: Why is alternative 5A the preferred alternative?

Response 3: See Response 13 in the letter from SEACC.

Comment 4: "We assume we can grow and grow; other countries have instituted a slow down, but we have not yet realized that our resources and our trees are a finite resource."

Response 4: We agree that trees are a finite resource, but they are renewable. Forest Service specialists share your concerns about unmanaged growth. However, these concerns need to be addressed at the Forest Plan level or higher. These are global issues that are outside the scope of this timber sale project. See also Response 13, letter from SEACC.

NARROWS CONSERVATION COALITION

P.O. Box 958
Petersburg, Alaska 99833

Tammy Malone
Bohemia MTN. IDT Leader
P.O.Box 309

Dear Tammy,

Thank you for the opportunity to comment on the Bohemia Mountain DEIS.Due to the seasonal requirements of my occupation, my involvement in the comment period has been seriously compromised. Considering the planning process has stretched over the course of months, not to mention, years, and considering my past requests that the timing ofsuch comment periods accommodate therealities of seasonal occupations of our community, I can only interpret your choice of public comment period to thwart the intention of NEPA to include the public in the planning process. Of course, we both know that,in reality,the politically decided timber targets have always been dissociated with any meaningful public participation short of litigation and acts of Congress. It has been a pleasure particpating in this charade with you.

I have had an opportunity to read the comments submitted by SEACC and speak on behalf of the NARROWS CONSERVATION COALITION in fully endorsing their excellent assessment of the Bohemia MTN. DEIS.

Sincerely,

David Beebe

David Beebe
NCC Executive Board Member

Letter from David Beebe, Narrows Conservation Coalition

Comment 1: "I can only interpret your choice of public comment period to thwart the intention of NEPA [National Environmental Policy Act] to include the public in the planning process."

Response 1: We realize that the surrounding communities rely heavily on seasonal occupations. When we scheduled our public meetings and subsistence hearings, we contacted the local Alaska Department of Fish and Game office and noted all the openings during the 45-day public comment period. The openings were delineated on a calendar and our meetings were scheduled around these as much as possible to accommodate the most people.

In addition, you or other members from Narrows Conservation Coalition met or corresponded with Tammy Malone or other members of the ID team to discuss the Bohemia Mountain Timber sale on the following dates:

May 31, 1989 - Mike Medalen from NCC had a phone conversation with Dave Schmitt and Maria Durazo, Petersburg Ranger District representatives.

June 9, 1989 - Becky Knight from NCC met with Maria Durazo.

June 5, l989 - Received letter from Mike Medalen responding to initial scoping document.

April 10, 1990 - Becky Knight and Mike Medalen spoke with Forest Service ID team leader Tammy Malone

February 8, 1991 - Dave Beebe met with Tammy Malone and discussed the Bohemia Mountain Timber Sale in the Forest Service Supervisor's Office building.

February 13, 1991 - Dave Beebe, Kurt Hoelting, and Mike Medalen from NCC met with ID team members Bob Daniels, Dave Helmick and Tammy Malone.

July 21, 1989 - Received letter from Becky Knight responding to initial scoping document.

February 21, 1991 - Dave Beebe stopped in to pick up original scoping document and visit with Tammy Malone.

March 3, 1991 - Sent letter to Dave Beebe, NCC, responding to 2-16-91 letter received from NCC.

On May 14, 1991, Dave Beebe was flown to and from Bohemia Mountain in the Forest-Service contracted helicopter. This was in compliance with his request to accompany ID team members in the field. He was able to join them in part of their field review of the mainline road location.

Members from the Narrows Conservation Coalition were present at the City of Kupreanof Council meeting on June 5, 1991. Forest Service representatives Dave Helmick, Everett Kissinger, Pete Tennis, and Tammy Malone reviewed the Draft EIS and answered questions for approximately two hours. Members from the NCC were also present at the open house and subsistence hearing held in Petersburg on June 25, 1991.

We believe this displays our efforts to be responsive to public concerns and work effectively with the public throughout the planning process. No matter when we schedule public involvement, we cannot meet the needs of everyone. It is difficult to schedule around summer work periods and winter vacations.

CITY OF KUPREANOF ALASKA

Post Office Box 50
Petersburg, Alaska 99833

Tammy Malone
IDT Leader Bohemia MTN. Sale
P.O.Box 309

July 15, 1991

Dear Tammy,
As Council member of the Kupreanof City Council I have been directed to submit the following comments to the Bohemia Mountain Timber Sale.

1) The Council is gravely concerned that this sale is on a"fast track" to be completed.It is clear there is pressure being exerted to get this sale out despite the fact that a new TLMP Revision is near completion. 1

2)Our local economic situation necessitates that tourism is a vital long term asset. This sale impacts the Portage Mountain Loop Trail which is a unique feature of our area and the roadless state is fundamental to the intrisic value.
3)Our City prides itself as a roadless rural community further enhancing its Tourism potential. We have no wish to see the further addition of over 22miles of new roads as well as the imminent connectionof our community with Kake. 2

4)An inadequate field analysis of road location and feasibility is glaringly obvious in the DEIS. My first-hand experience hiking the proposed route with the IDT confirmed my worst fears of a Federal agency rounded upon conservation values, yet carrying out ridiculousorders to meet a ridiculous timber target. 3

5)The fact that this sale will cost the taxpaying public millions of dollars is outrageous.It is clear this could only happen by way of a political pork barrel process. 4

6)The subsistence analysis in the DEIS makes totaly incorrect assumptions in regards to the importance of the area to deer hunting, the significance orpoaching, and the totally inadequate data used to evaluate the situation. 5

7)VCU 441,442, and 424 possess values of the highest order. It is clear that these values are taking second place to timber production. 6

8)Due to our community's dependence upon tourism potential the entire Duncan-Salt Chuck creek should be classified as a wild and scenic river. 7

cont.

CITY OF KUPREANOF ALASKA

Post Office Box 50
Petersburg, Alaska 99833

9) The timing of the public comment period for the DEIS is as usual occuring at the height of our seasonal employment. We feel this timing is absolutely inexcusible and is contrary to Section 203 which mandates public involvement. (NEPA) 8

10) It is clear that the greatest volume of timber underscores unreasonable targets to the detriment of impacted communities and other equally valid economic values. We are distressed that this DEIS is fails to address the cumulative impacts on the forests of our island. 9

11) We fail to see the value of New Perspectives implementation when most alternatives involve the highest amount of fragmentation. 10

12) The sale area will expose more acreage of scenic value as unsightly clearcuts to the tourist, further impacting tourism potential of the area. 11

13) The City of Kupreanof opposes a timber in the Bohemia Mountain Range as long as inadequate data and analysis are used to conduct a timber sale.

Sincerely,

David Beebe

David Beebe
Councilmember

Letter From David Beebe, City of Kupreanof

Comment 1: "The council is gravely concerned that this sale is on a 'fast track' to be completed. It is clear there is pressure being exerted to get this sale out despite the fact that the new TLMP Revision is near completion."

Response 1: The Bohemia Mountain Timber Sale has been on the timber sale action plan since 1985. This and other sales being planned on the Stikine Area are currently part of the 10-year timber sale schedule for the Area, as referred to in the current Tongass Land Management Plan, Amended 1985-86. The timing of this project is coincidental to the Tongass Land Management Plan Revision process, and, although we cannot wait for the Revision to be completed before we plan this sale, we are incorporating many of the new ideas associated with the Revision effort to be responsive to changing needs. In fact, the scheduled sell date has been pushed back one year from 1992 to 1993 to make sure all issues pertaining to this sale have been thoroughly addressed.

Comment 2: "This sale impacts the Portage Mountain Loop Trail, which is a unique feature of our area and the roadless state is fundamental to the intrinsic value."

Response 2: See Response 2 to the letter from SEACC.

Comment 3: "An inadequate field analysis of road location and feasibility is glaringly obvious in the DEIS."

Response 3: During the summer of 1991, as planned in the Draft, adequate field data collection and analysis was conducted to support the documentation used in the decision-making (NEPA) process. See also Response 9, letter from SEACC.

Comment 4: "The fact that this sale will cost the taxpaying public millions of dollars is outrageous."

Response 4: See Response 15 in the letter from Dixie Baade.

Comment 5: "The subsistence analysis in the DEIS makes totally incorrect assumptions in regards to the importance of the area to deer hunting, the significance of poaching, and the totally inadequate data used to evaluate the situation."

Response 5: We disagree. The information used in analyzing subsistence use is from research of technical reports from Alaska Department of Fish and Game, Tongass Resource Use Cooperative Survey data, and community meetings and hearings. It has been illegal for anyone to harvest deer on Kupreanof since 1975, so subsistence use of that resource, one of the two most important, should of course not be affected. Salmon populations are not likely to be affected, since spawning and rearing areas within the affected area would be protected with buffers and other BMP's. Sport fishing is likely to increase with the logging camp, but the effect on subsistence is expected to be minimal.

Comment 6: "VCU 441, 442, and 424 possess values of the highest order. It is clear that these values are taking second place to timber production."

Response 6: See Response 6 in the letter from SEACC.

Comment 7: "Due to our community's dependence upon tourism potential, the entire Duncan Salt Chuck Creek should be classified as a wild and scenic river."

Response 7: See Responses 7 and 8 in the letter from SEACC.

Comment 8: "The timing of the public comment period is inexcusable and is contrary to section 203 which mandates public involvement (NEPA)."

Response 8: See Response 1 in the letter from the Narrows Conservation Coalition.

Comment 9: Choosing the alternative with the greatest timber volume "underscores unreasonable targets to the detriment of impacted communities and other equally valid economic values. We are distressed that this DEIS fails to address the cumulative impacts on the forests of our island."

Response 9: See Response 1 in the letter from Victoria McDonald, Response 16 in the letter from SEACC, Response 1 in the letter from Kake, and Response 1, above.

Comment 10: "We fail to see the value of New Perspectives implementation when most alternatives involve the highest amount of fragmentation.

Response 10: See Response 15 to the letter from SEACC.

Comment 11: "The sale area will expose more acreage of scenic value as unsightly clearcuts to the tourist, further impacting tourism potential of the area."

Response 11: See Response 12, letter from SEACC.

Mitkof Lumber Company, Inc.
Post Office Box 89 • Petersburg, Alaska 99833 • Phone (907)772-3816

U.S. Forest Service
Supervisors Office
P.O. Box 309
Petersburg, AK 99833

Attn: Tamara S. Malone, IDT Leader

Re: Bohemia Mountain Timber Sale, Draft Environmental Impact Statement

July 15, 1991

Dear Ms. Malone:

This letter points out contradictions the document appears to have with respect to the Timber and Human Resources.

The introduction states, "The purpose of this project is to locate and design a timber sale for an independent purchaser.....", and, "the area is allocated primarily to LUD IV in the forest plan which emphasizes commodity uses allowing timber harvest." However, the preferred alternative provides timber values of minus $54/MBF to minus $60/MBF. Also, economics of the sale assume the purchaser would suffer a reduction in profit risk benefit of 60% of normal (see chapter 2, page 18).

Based upon the timber data and economic factors used to develop the preferred alternative, it is my opinion that the timber sale will be uneconomically feasible for an independent operator to bid on and complete. This issue was somewhat raised on chapter 1, page 6 but not adequately addressed on how an economically unfeasible timber sale will affect human resources. Totally missing in chapter 4 (Environmental Consequences) is any mention of the adverse effects which cannot be avoided to human resources when developing an economically unfeasible timber sale. 1

Assumptions have been made by the Forest Service that this timber sale will be bid on and that the purchaser will be financially

successful in completing the timber sale contract. Due to the inability of the Forest Service to meet it's annual timber harvest goals and the fact that those sales sold, continually cut out less that that which was advertised, the results are independent operators starved for timber. So, probably there will be a bidder hoping to prevent bankruptcy. However, in all likelihood the purchaser will not be able to financially survive to the end of the contract.

With the above knowledge prior to advertising the sale, I would like to see under "Mitigation of Consequences" retribution to the independent operators secondary businesses and communities directly and indirectly impacted by a timber sale that is not economically feasible to bid on and complete. 2

Furthermore, as this is a public document, the public should be made aware that the Forest Service achieves their timber harvest goals based on that volume advertised and not what is actually cut. 3

Sincerely,

Greg Harris
General Manager

cc: Chilkoot Lumber

Letter from Greg Harris, Mitkof Lumber Company

Comment 1: "Based upon the timber data and economic factors used to develop the preferred alternative, it is my opinion that the timber sale will be uneconomically feasible for an independent operator to bid on and complete."

Response 1: See Response 15, letter from Dixie Baade.

Comment 2: "I would like to see retribution to the independent operators secondary businesses and communities directly and indirectly impacted by a timber sale that is not economically feasible to bid on and complete."

Response 2: See Response 16, letter from Dixie Baade.

Comment 3: "The public should be made aware that the Forest Service achieves their timber harvest goals based on that volume advertised and not what is actually cut."

Response 3: Yes, this is true. The public is made aware that we do not cut everything we advertise. This is supported by a table shown on page 3-377 of the Draft TLMP Revision document. The table shows offers sold and harvested and explains both short-term and long-term sales.

H Appendix

RECEIVED
JUL 15 1991
STIKINE AREA
TONGASS NATIONAL FOREST

Forest Supervisor
Tongass National Forest
Stikine Area
P.O. Box 309
Petersburg, Alaska 99833

Dear Forest Supervisor,

Following are comments I have regarding the Draft Environmental Impact Statement for the Bohemia Mountain Timber Sale.

Timber harvest volume in the preferred alternate was increased dramatically from a similar sale offered in 1981 which failed to sell. The common perception is that this increase is in response to pressure the outgoing Forest Supervisor has received for failing to meet timber targets in the past. It appears that the only reason the preferred alternative was chosen was to harvest the greatest volume of timber since there is no adequate discussion on why that alternate was preferred. 1

Except for the "No Action" and alternate #3 all alternatives return between - $29/MBF and - $111/MBF. The preferred alternative returns - $54/MBF or - $60/MBF depending on road location. Another deficit timber sale is unacceptable. 2

Several aspects of road location are particularly worrisome for this sale. High hazard soils are encountered along road locations which border Duncan Salt Chuck Creek, a Class I salmon stream. Soils have been classed as "especially hazardous" however "despite potentially serious soil hazard a mainline road is feasible..." and "any slides or slumps into the analysis area are expected to recover relatively quickly." An obvious assumption, this says nothing of what effects such activity may have on the Class I salmon stream which would be directly affected. According to the IDT leader, several on the ground reviews have been made of this high hazard area and knowing what I know of the IDT process, the team has talked itself into the feasibility of this road location due to pressure to "get the cut out." No adequate analysis had been made on this possible road location in steep v-notches incised in blue clay deposits. 3

The possibility of a road crossing LUD II land between Kake and Portage Bay and inching it's way closer to the communities of Kupreanof and Petersburg is also controversial. If this road connection is built it would link Kake within 12 miles of these communities. Although the FS has continually denied any interest in such a link and termed it "beyond the scope of the project" continual references are made to the topic in the DEIS. Residents of Kupreanof, Petersburg, and many in Kake are already on record as opposing such a connection. Regardless of whether the connection is built though, the extended road will come close enough to the LUD II area to justify a road in the future with 4

the next new influx of FS personnel, since the present LUD II designation (labeled as a "mistake" by the FS) in all likelihood will be placed in a timber harvest designation under the new Forest plan.

The Forest Service should be reminded that according to the definition of LUD II land "Roads will not be built except to serve authorized activities such as vital Forest transportation system linkages when no other feasible land or water routes exist." Since the road will directly affect 160 acres of LUD II land the road connection linking Portage Bay to Kake should not be built. There is a land route from units in the Bohemia Area to Kake, and a log transfer site at Portage Bay to service units located in that area.

The proposed road location also intersects with the Portage Bay / Petersburg Lake / Duncan Salt Chuck Loop Trail. Presently it is one of the longest trails in the area that can be traveled without the need to carry a tent by using cabins along the way. By severing the trail with a road and associated impact from logging activity, the value of the trail will be greatly decreased. 4 (cont.)

Road 6030 also infringes not only on highly important fish habitat, but also on sensitive wildlife habitat through a low lying wetland area which is important nesting, resting, and feeding habitat for bird species such as Canada Goose. The road corridor infringes on several small inland lakes and ponds important to these birds. The DEIS does not adequately explain what mitigation measures will be done to eliminate associated impacts. 5

Although Duncan Salt Chuck Creek "meets the guidelines for wild classification for all 12 miles of stream" the FS chose to downgrade the portion needed to access timber to a scenic designation which would permit road crossing. This decision was based primarily on 2 assumptions: 1) In the "context" of comparison to Castle River and Petersburg Creek it is "Not Unique." 2) The intertidal lagoon or salt chuck are common in Southeast Alaska. Perhaps in the "context" of Southeast Alaska these streams have common features, but by the admission of the FS are not well represented in the National System.

The Alaska Department of Fish and Game lists this stream as one of 19 high value watersheds in Southeast Alaska. The FS loses nothing by designating the portion of the river in wilderness as a wild river. However designation of the portion of the river outside of the wilderness area as wild would put the sale in jeopardy. The outcome of this designation is not coincidental. It appears that the FS decided long ago how to classify the stream, and then attempted to justify its recommendation. They have ignored their earlier statement the "Duncan Salt Chuck Creek has outstandingly remarkable fish, recreation, wildlife, historic and scenic values of national 6

significance because of the combination of high values." It is my opinion that the entire length of Duncan Salt Chuck Creek be designated as wild and scenic. Also, the determination on whether to recommend Duncan Salt Chuck Creek in the National System should have been evaluated independent of the timber sale which depends on a downgraded classification. It should have appeared in the Forest Plan Revision. 6 (cont.)

In addition the Forest Service should evaluate several streams and rivers within/ VCU 424, 421 and 442 for inclusion within the national system. All these VCU's received high rankings for primitive recreation, sport and commercial fisheries and estuarine sensitivity in the Tongass Land Management Plan, 1979. 7

The DEIS analysis of the effects of logging on wildlife populations is inadequate. A thorough study of current wildlife populations in the study area should be completed and not based on "models" or "potential populations". The effect of poaching due to increased accessibility should be considered. A map of old growth blocks of timber used for winter range should be included. Little or no analysis was shown in the DEIS on what effects fragmentation of old growth tracts would have on wildlife habitats, especially since alternatives 4,5, and 5A propose maximum fragmentation. This is not a New Perspectives element contrary to the DEIS claim. Because deer winter range has been hard hit in the Kake area, winter range in the Bohemia/Portage area is of high value and logging should be avoided completely in those areas. And although the FS says that this area is no longer important for subsistence hunters it may well be again in the future as deer populations are on the increase on Kupreanof Island and hunters may return to this more accessible area. 8

Finally, the sale on the north end of Kupreanof Island is concentrated along highly scenic route for boat travelers. The State Ferry, several cruise ships, commercial fishermen and private boaters alike will be affected by this highly visible sale. 9

In my opinion the FS has not adequately analyzed the impacts logging will have on this area and should not only defer recommendation of Duncan Salt Chuck Creek to the National Wild and Scenic River System, but defer the sale until the proceeding issues are addressed in depth.

Sincerely,

Rebecca J. Knight

Rebecca J. Knight

Letter from Rebecca J. Knight

Comment 1: "It appears that the only reason the preferred alternative was chosen was to harvest the greatest volume of timber, since there is no adequate discussion on why that alternate was preferred."

Response 1: See Response 13, letter from SEACC.

Comment 2: "Another deficit timber sale is unacceptable."

Response 2: See Response 15, Baade letter

Comment 3: There is a problem with some of the road locations being situated in high hazard soil areas; the IDT has "talked itself into the feasibility of this road location due to pressure 'to get the cut out'".

Response 3: See Response 3, letter from the City of Kupreanof.

Comment 4: The possibility of a road crossing LUD II land between Kake and Portage Bay is controversial. Residents of Kupreanof, Petersburg, and many in Kake are already on record as opposing such a connection. Roads should not be built on LUD II land when other feasible land or water routes exist. The road location would also have a negative impact on the Portage Mountain Loop Trail.

Response 4: See Response 3 to the letter from SEACC and Response 1 to the letter from Kake.

Comment 5: Road 6030 infringes on sensitive wildlife habitat through a low-lying wetland area which is important nesting, resting, and feeding habitat for bird species such as Canada goose.

Response 5: See Response 3, letter from SEACC.

Comment 6: The Forest Service chose to downgrade to a scenic designation the portion of Duncan Salt Chuck Creek that is needed to access timber, which would permit road crossing. "Perhaps in the 'context' of southeast Alaska these streams have common features, but by the admission of the FS are not well represented in the National system."

Response 6: See Responses 7 and 8, SEACC letter.

Comment 7: The Forest Service should evaluate several streams and rivers within VCU 424, 421, and 442 for inclusion within the national system.

Response 7: See Response 6, SEACC letter.

Comment 8: The DEIS should include analysis of the effects of forest fragmentation and logging in deer winter range.

Response 8: See Response 15, SEACC letter.

Comment 9: The sale is concentrated along a highly scenic route for boat travelers.

Response 9: See Response 12, SEACC letter.

July 14, 1991

USFS
Mtn Tamara Malone
Box 309
Petersburg, Alaska 99833

RECEIVED
JUL 16 1991
STIKINE AREA
TONGASS NATIONAL FOREST

Re: Bohemia Mtn Timber Sale

I am writing to oppose the "prefered alternative" in the draft EIS for the Bohemia Mtn Range logging sale - which if allowed to go forward would mean clearcutting 30 plus million board feet and building 20 miles of road - It's too much. 1

I am especially concerned about the possibility of ever building a road through the current LUD II "Roadless" area - linking Kake & Portage Bay. This is not and should not ever be set up to be a vital road link I am opposed to any road intersecting the Portage Bay/Petersburg Lake/Duncan Salt Chuck Loop Trail - Downgrading the the River status from Wild to Scenic to pave the way for future road construction was a low blow, Additionally I am concerned that this is a back door attempt towards an eventual road connection between Kupreanof & Kake... 2

Kupreanof Island has already been heavily logged and is currently being logged. The north end has some of the last remaining undeveloped areas on the Island - A sale of this size, with significant impact to wildlife habitat, is not justifiable when it is being used by the district just to meet beaurcratic timber targets. 3

The area if logged will be highly visiable from Frederick Sound - As someone who flies up frequently around Big Creek Portage Bay & Pinta Pt I find this really depressing. The scenic value is definitely not as easily quantifiable as the 1 time timber jobs the sale offers but to me personally and many others people I'm sure - extremely valuable nonetheless. 4

These conclude my personal concerns & comments.

My mother, Neva Bowen, is too ill to write but wishes to add her opposition to the proposal & express her concern regarding the potential impact that logging & roading will have on all the small creeks in the sale area. 5

She is also concerned about the impacts to bird habitat - geese, ducks ect in that logging & roadbuilding (& road use) will have. She wants to stress that the grassland areas in the proposed sale are important resting/feeding habitat for geese in the fall. 6

Please keep us informed & up to date on any proposed activity in the Bohemia Mtn area (the preferred North end) - The current proposal is inappropriate in scale & need.

Nuette Bowen
220 W Mono
Anchorage, Alaska 99501

Neva Bowen
Box 68
Petersburg, AK
99833

Letter From Nevette and Neva Bowen

Comment 1: A road connecting Kake and Portage Bay "is not and should not ever be set up to be a vital road link."

Response 1: See Response 3, letter from SEACC.

Comment 2: "Downgrading the river status from 'wild' to 'scenic' to pave the way for future road construction was a low blow...I am concerned that this is a back loop attempt towards an eventual road connection between Kupreanof, Petersburg, and Kake."

Response 2: See Response 3, letter from SEACC

Comment 3: "A sale of this size, with significant impact to wildlife habitat, is not justifiable when it is being used by the district just to meet bureaucratic timber targets."

Response 3: See Response 1, Kupreanof letter, and Response 13, SEACC letter.

Comment 4: "The scenic value [of the area visible from Frederick Sound] is definitely not as easily quantifiable as the one time timber jobs the sale offers, but to me personally and many others I'm sure, extremely valuable nonetheless.

Response 4: See Response 12, letter from SEACC.

Comment 5: There is a potential impact on small streams from the logging and roading activities.

Response 5: See Response 4, letter from Dixie Baade.

Comment 6: The logging and roadbuilding activities could have an impact on goose and other bird habitat.

Response 6: See Response 3, letter from SEACC.

Alaska Forest Association, Inc.

MAIN OFFICE:
111 STEDMAN SUITE 200
KETCHIKAN, ALASKA 99901-6599
Phone 907-225-6114
FAX 907-225-5920

GOVERNMENT AFFAIRS OFFICE:
217 SECOND, SUITE 206
JUNEAU, ALASKA 99801
Phone 907-463-3175
FAX 907-463-5515

July 25, 1991

Forest Supervisor
Stikine Area
Box 309
Petersburg, AK 99833

Dear Sir:

Please consider our comments on the Bohemia Mountain Timber Sale DEIS. The Alaska Forest Association recommends the adoption of Alternative 5.

The Tongass Timber Reform Act directs the Forest Service to develop a timber sale program that "seeks to meet market demand". The market demand for timber from the Tongass National Forest is in excess of 465 million board feet per year. This represents an increase over the 418 million board feet in the upcoming Draft Tongass Land Management Plan. Since all of the Alternatives in the Draft Bohemia plan are viable, The Tongass Timber Reform Act dictates that the Forest Service select the Alternative that comes closet to meeting market demand.

In addition their are changes that can be made that will increase timber outputs of all alternatives without jepordizing other resource outputs.

The buffer strip of 500 feet of beach fringe and 1000 feet of estuary fringe is not necessary to protect wildlife values. Any required protection can come from a smaller reserve area and should be designed to only accomodate specific problems. Therefore "Mitigation of Consequences (b)" violates the Tongass Timber Reform Act.

Forest Supervisor
July 25, 1991
Page 2

The AFA opposes wild and scenic river designations. Congress was aware of wild and scenic river proposals at the time it acted on Tongass legislation. Not only did the Congress fail to designate any "wild and scenic rivers" it stated conclusively during the meeting of the conference committee and on the floor of each House that it did not intend to revisit the Tongass issue (which designating wild and scenic rivers would require). Accordingly, for this reason, there should be no wild and scenic river designations proposed for Congressional action. Nor should there be administrative set-asides by the Forest Service to reserve the right of Congress to make wild and scenic river designations after the year 2000.

Indeed, the Alaska Forest Association believes that the proposal to add wild and scenic rivers violates Section 1326 of ANILCA. Section 1326(b) of ANILCA prohibits additional land studies by agency:

> "(b) No further studies of federal lands in the State of Alaska for the single purpose of considering the establishment of conservation system unit, national recreation area, national conservation area or for related or similar purposes shall be conducted unless authorized by this act or further act of Congress."

The Forest Service has attempted to get around the "no-more" clause by stating that land use planning is not for a single purpose. This misreads the statute. It prohibits studies which have within them proposals for the use of an area for a single purpose (such as the establishment of a conservation system unit, which includes a wild and scenic river - see Section 1024(4). This reading is consistent with Section 101(d) describing the purposes of the ANILCA:

Forest Supervisor
July 25, 1991
Page 3

> "(d) This act provides sufficient protection for the national interest in the scenic, natural, cultural and environmental values on the public lands in Alaska, and at the same time provides adequate opportunity for the satisfaction of the economic and social needs of the State of Alaska's people; accordingly, the designation and disposition of the public lands in Alaska pursuant to this act are found to represent a proper balance between the reservation of national conservation system units and those public lands necessary and appropriate for more intensive use and disposition and thus Congress believes that the need for future legislation designating new conservation system units, new national conservation areas or new national recreation areas has been obviated thereby." (emphasis added)

For these reasons, we believe the Forest Service has erred by including wild and scenic river proposals in the alternative, and request that such designations be deleted.

We are concerned that the helicopter logging proposals are not justified. Helicopter logging is very expensive and should only be used in cases where no other viable alternative is available. In many cases it has been a luxury frill that is not justified under reasonable resource plans.

The whole DEIS is permeated with a lack of economic reality. Small unit size, helicopter logging, low volume per mile of road construction and unnecessary harvest restrictions all increase the cost per unit of timber harvest. These costs are not required by timber harvest but are a cost to wildlife, visual restrictions and other resources and must be included as a debit to the timber return in the TISPIRS accounting.

Forest Supervisor
July 25, 1991
Page 4

We will look forward to your final plan.

Sincerely,

Larry B. Blasing

Larry B. Blasing
Administrative Assistant

STATE OF ALASKA

WALTER J. HICKEL, GOVERNOR

OFFICE OF THE GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET
DIVISION OF GOVERNMENTAL COORDINATION

SOUTHCENTRAL REGIONAL OFFICE
3601 "C" Street
SUITE 370
ANCHORAGE, ALASKA 99503-2798
PHONE: (907) 561-6131
FAX: (907) 561-6134

CENTRAL OFFICE
P.O. BOX AW
JUNEAU, ALASKA 99811-0165
PHONE: (907) 465-3562
FAX: (907) 465-3075

NORTHERN REGIONAL OFFICE
675 SEVENTH AVENUE
STATION H
FAIRBANKS, ALASKA 99701-4596
PHONE: (907) 451-2818
FAX: (907) 451-2814

August 7, 1991

Stikine Area
AUG 12'91
Forest Supv.
P.I.O.
A.O.
Eng. Staff
F&WL Staff
Planning Staff
RL Staff
S&W Staff
Timber Staff
Pabg. Dist.
Wmcl. Dist.

Ms. Laura Nelson
Acting Forest Supervisor, Stikine Area
U.S. Forest Service
P.O. Box 309
Petersburg, AK 99833

Dear Ms. Nelson:

SUBJECT: BOHEMIA TIMBER SALE DEIS
STATE ID NO. AK910606-18J

The Division of Governmental Coordination has concluded the State of Alaska's review of the draft environmental impact statement for the Bohemia timber sale, according to the National Environmental Policy Act (NEPA). We appreciate the opportunity to participate at this stage of planning, and offer a consolidated response on behalf of the State resource agencies (Alaska Departments of Environmental Conservation, Fish and Game, and Natural Resources). As this review was conducted to satisfy the requirements of NEPA, the State comments include a broad range of issues.

Ultimately, per 15 CFR 930, Subpart C, the activity is required to be consistent to the maximum extent practicable with the standards of the Alaska Coastal management Program (ACMP). At the time the USFS submits a federal consistency determination to the State, the State will conduct an ACMP review. Therefore, the State is taking advantage of this opportunity to also preliminarily address potential ACMP issues. We hope these comments will be used by the USFS to help resolve issues prior to the ACMP review.

The State previously participated in a scoping review in April 1989 under State ID No. AK890411-05J.

-A35LH

Laura Nelson 2 August 7, 1991

PROJECT DESCRIPTION

The project proposed in the DEIS is a timber sale for an independent purchaser in the Bohemia Mountain area on north Kupreanof Island, and also to determine the suitability of Duncan Salt Chuck Creek for possible inclusion in the Wild and Scenic River System.

In 1982 an environmental assessment for the Bohemia study area was completed, which designed a sale to harvest 24.1 MMBF in 18 clearcut units and construct 28.9 miles of road. This sale never sold, but the mainline road was constructed (FR 6030). The currently proposed Bohemia Mountain sale is being considered as market conditions in southeast Alaska are improving.

Alternative 5A has been selected as the preferred alternative. Under this alternative, 34.8 MMBF of timber would be harvested (30.3 MMBF by cable, 4.5 MMBF by helicopter) from 1,456 acres (1,306 by cable, 150 by helicopter). Either 23.5 miles of road would be constructed north, or 26.7 miles south, requiring 21 additional stream crossings. Of all the alternatives, 5A harvests the second largest amount of volume and builds the second greatest amount of roads. For this alternative, both the existing Portage Bay and Little Hamilton log transfer facilities would be used.

The question of whether the Duncan Salt Chuck Creek should be recommended for inclusion in the Wild and Scenic River System would normally occur in the Forest Plan revision, but because the status of the stream could affect the location and design of the subject sale, the decision regarding the river is being made in conjunction with the timber sale analysis. The creek meets the guidelines for wild classification for 12 miles. Segment 1 of the river, the portion from the falls at the outlet of the salt chuck upstream to the wilderness boundary, is recommended in the DEIS to be a wild river. Segment 2, from the wilderness boundary upstream to Bohemia Lake, is recommended as a scenic river. The area has outstanding fish, wildlife, recreation, and scenic values of regional significance due to the concentration of these values in a small area. The visual resource is related primarily to views from the salt chuck, which include peaks of the Portage Mountains as a backdrop to the placid salt chuck water and the open grass flats.

New perspectives will be implemented in the Bohemia Mountain timber sale. The following new perspective concepts were used as design elements in all alternatives: internal exclusions, maintenance of large blocks of old growth, public participation, and maintenance of high value wildlife habitat within beach fringes, riparian zones, and estuaries.

NEPA COMMENTS

The document is well written. The documentation of other past or planned activities in the surrounding area is very beneficial. The discussion of the forest fragmentation issue is

excellent. This DEIS seems to build on strengths of the Starfish Timber Sale DEIS, an approach for which the Forest Service should be commended.

In the FEIS, maps are needed to show place names referred to in the text, among them: Bohemia Lake, trails discussed in the recreation section, the wilderness area boundary and an indication of the topography of the study area. In particular, the omission of topographical lines on the maps seriously hampered the review of the DEIS. In the FEIS, we recommend the Forest Service use maps similar to those used in the APC 86-90 environmental documents, particularly for the maps of each alternative, and the road system. The need for maps regarding the large blocks of old growth is also discussed later in detail.

Water Quality:

In terms of potential impacts on water quality, alternative 3 is the most preferable. Also, alternative 3 is the only alternative (aside from no action) that does not propose a below-cost sale. Alternative 3 provides for less harvest of timber than the other alternatives. Should the USFS decide the amount of timber in alternative 3 is not sufficient to meet demand, it is likely that selection of another alternative (a below-cost timber sale) will have to be justified. Concerns regarding the potential for water quality impacts are discussed in more detail in the following "road" section.

Monitoring:

A Memorandum of Understanding between the USFS and DEC, as well as the Alaska Nonpoint Source Pollution Control Strategy, requires the USFS to conduct monitoring. The draft EIS contains an effectiveness monitoring plan that appears to pose all of the important and relevant questions. Also, we are aware of the recently instituted effort to conduct BMP implementation monitoring. However, the monitoring plan for BMP implementation and effectiveness needs to be more detailed, as the draft EIS is missing information about which specific concerns the USFS has for water quality and, therefore, for water quality monitoring. It should include information on the sites to be monitored, the sampling intensity, and the parameters to be measured. If it is determined that water quality monitoring is not necessary, justification needs to be provided. For example, justification is needed on why a particular area should or should not be monitored with respect to specific parameters such as sedimentation in spawning areas or changes in dissolved oxygen levels in anadromous fish habitat. In order to have a complete monitoring plan, such site or watershed-specific information is necessary. Likewise, it would be appropriate to state the level of effort anticipated for BMP implementation monitoring. The measure of effectiveness of BMPs relating to water quality should be effectiveness at meeting State water quality standards.

Also, DFG states that the mitigation and monitoring section is deficient as it lacks specific information relating to habitat. For example, there is no discussion regarding how effectiveness of retention areas and buffer strips will be determined. At a minimum, a list of monitoring techniques to be used and the monitoring objectives should be given. Additionally, what remedial actions will be taken if monitoring shows that design features or mitigation measures are not effective or not implemented? Simply noting problems or situations on unit cards is not a solution.

We request that the State resource agencies (DEC, DNR, and DFG) receive copies of monitoring reports for all three types of monitoring (implementation, effectiveness, and validation).

Soil stability:

The State's review identified the maintenance of soil stability as one of the major issues to address within this sale. We appreciate the thorough discussion of this subject in the Landform and Soils, and Watershed sections of the document. Our concerns are discussed more thoroughly in the preliminary ACMP comment section of this letter.

Old growth:

From a wildlife perspective, forest fragmentation is greatest in the preferred alternative thus could impact species which require large blocks of old growth. This is of major concern to DFG.

Over the entire 67,689-acre analysis area, most of the timber stands are old growth. All the alternatives incorporate to varying degrees the concept of minimizing entry into large interconnected blocks of old growth habitat. Alternatives 1 and 3 maintain four blocks ranging in size from 1,040 to 7,020 acres. Alternatives 2, 4, 5 and 5A maintain three blocks ranging in size from 1,040 to 7,020 acres. The DEIS states that maintenance of large blocks of old growth is a new perspectives element common to all alternatives. This statement needs further clarification, as alternatives 4, 5, and 5A propose considerable fragmentation of forest in the areas to be cut. For example, the total acreage of old growth blocks larger than 1,000 acres is 11,684 acres under the no action alternative, 11,534 acres under alternative 3, and 6,758 acres under the preferred alternative. An explanation of how this new perspective element relates to the rotation harvest of this area and old growth retention is needed.

Retention:

The Forest Service needs to formally designate old-growth retention areas, as required under TLMP. This designation should include a map of the old growth retention areas and an evaluation of the blocks regarding their value to wildlife. This evaluation should indicate

where the blocks are and the composition of the habitats, including volume class information, within them. Do the acres of maintained large blocks of old growth overlap the acres retained as high value habitat? If the acres are not considered high value habitat, the FEIS should contain a discussion of the benefits for retention. A cumulative effects discussion should also be included relating retention withdrawals to the ability of the USFS to meet allowable sales quantity over the rotation.

We also have concerns with the method used to select habitat retention for wildlife. We approve of using the species habitat capability models to help determine areas of permanent retention. But, as in our comments on the Etolin Island Starfish Timber Sale, we do not completely agree with the method used to select wildlife habitat for retention described on page 2-2. Using a mean HSI value for all indicator species to determine retention areas is likely to exclude critically important habitat for some species. Species that have narrow or specialized habitat requirements won't have their habitat protected. The highest value, sometimes most critical, areas for some species can be lost because they are of limited value to other MIS species.

A suggested option for selecting retention for wildlife would be to protect a percentage of the most important habitat for each species. Thus, the Forest Service might evaluate retaining 20% of the most important (highest HSI value) deer habitat, 20 percent of the most important marten habitat, 20 percent of the most important black bear habitat, etc. Another option would be to evaluate a retention scheme made up of some combination of the most important habitats and the HSI averaged habitats. In any event, some of the highest value habitat for each species should be included in any retention plan. The policy of averaging HSI values to determine all retention areas may not provide for this. The needs of each species should be looked at individually, not collectively. While the selected method for retention is a good starting point, we are disappointed to find it used again, without modification, after our comments on the Starfish sale. The State suggests further consultation with the State for assistance in resolving a mutually acceptable way of designating retention for wildlife habitat.

Alternatives 2 or 3 or another alternative that concentrates timber harvest near the current road terminus appear to result in less overall fragmentation in the study area than the alternative selected. More information is needed on long-term timber harvest plans for the area in order to assess wildlife impacts in the context of the planned rotation.

<u>Roads</u>:

The preferred alternative avoids construction of the Kake/Portage connection road at the head of Portage Bay, and alternative 5 is the only alternative in which the connection road is considered. Other alternatives would use both LTFs and maintain separate road systems. The State of Alaska's policy promotes provision of roads for its residents, when desired by affected citizens, in the absence of other reasons precluding its construction.

Laura Nelson 6 August 7, 1991

Notwithstanding any unforseen opposing constraints (i.e., social, physical, environmental), the State supports consideration of the Kake/Portage connection road. The DEIS states that the road connection specified in alternative 5 would improve the area's economy, management flexibility, and safety. Specifically, the road connection would (1) allow transportation between Portage Bay and Petersburg, (2) improve access to the USFS administrative site and the logging camp at Portage Bay, (3) benefit businesses in Kake since some shopping by residents of Portage Bay would likely occur, (4) enhance USFS multiple use management because crews could utilize the Portage Bay administrative site, (5) increase vehicle accessibility to Portage Bay for other management activities, (6) provide future timber management flexibility by utilizing both LTFs, (7) enhance Kake Tribal Corporation's ability to bid on National Forest timber sales, (8) increase roaded recreational opportunities, and (9) provide trailhead opportunities for access into the Wilderness Area. However, the DEIS states that the residents in Petersburg, Kake, and Kupreanof believe this connection may have the following impacts:

1. The proposed road location crosses a portion of LUD II land, which are to be managed in a roadless state to retain their wildland character (but allow access roads in some cases to access lands on either side of an LUD II area). The LUD II area is a remnant of a larger area, most of which was included in the Petersburg Creek-Duncan Salt Chuck Wilderness.

2. It would link existing roads to within 12 miles of Petersburg. This would raise the issue of the possibility of the State building the remaining portion.

DFG has raised additional concerns about the road connection for consideration by the USFS. There was no discussion of wildlife impacts by the connection in the DEIS. DFG's concern is construction of a road through timber adjacent to an estuary that has very high fish and particularly wildlife values. It is a significant wildlife travel corridor (particularly for black bears and wolves), is a spring and fall concentration area for black bears, has a couple of important anadromous fish streams, and is adjacent to a waterfowl concentration area. This area is selected for retention in the DEIS and the road would compromise this value. The alternative which builds this road also harvests timber within this high value wildlife area. Significant increases in subsistence and other consumptive use of fish and wildlife will occur in this sensitive wetland area if this connection is constructed. The State requests more information in the FEIS regarding these concerns, as well as an assessment of public input from the affected communities.

Regarding the two alternatives that exist for locating a segment of collector road 6030 that would parallel the gorge of Duncan Salt Chuck Creek, it is not clear from the document what the "north/south road options" are, or how selection of one or the other would affect the alternatives. There is not a map in the document which labels the north or south options. On the map of each alternative, two proposed roads appear, one north and one south of

Duncan Salt Chuck Creek and discussions suggest these are the north/south routes referred to. However, the north road is the only one which appears to access timber in the southern Bohemia Mountain area. This items needs to be clarified. The south route is located near the top of a ridge that parallels the creek, and drainage would occur away from the creek. The north road will cross at least five deep V-notches. More information is needed on impacts from both routes, to enable the State to be able to recommend a preferred alignment alternative. To help in this effort, the Department of Environmental Conservation expressed concern about building a road near Duncan Salt Chuck Creek (the south alternative). A road will be built through the same area to the north, further from the creek, if alternatives 4, 5, or 5A are chosen, and building a road adjacent to the creek (the south route) would include risks of degradation to water quality.

Volume class:

We would like to see a table of acreage and volume class indicating board feet of timber for each proposed unit in each alternative in the FEIS. This table should also include volume class information for the entire sale area and for the proposed retention areas.

Subsistence:

The DEIS depicts impacts on subsistence use as minor. This may not be a valid conclusion in the context of cumulative impacts. While the EIS identifies impacts from this sale as minor, cumulatively a series of minor impacts from additional actions planned over the rotation may add up to a major impact. Impacts (short-term and cumulative) through competition for subsistence resources between residents of the logging camp and subsistence users from communities which harvest fish and wildlife in the Portage Bay area must be taken into consideration. The DEIS identifies affected species as deer, furbearers, waterfowl, black bear, salmon, other finfish, and marine mammals. DFG advises that affected species include salmon, halibut, shellfish, waterfowl, black bear, and furbearers. Deer are not included in the list because of the currently closed season on Kupreanof Island.

Economics:

The Mitigation of Consequences section of the summary indicates that eight times the minimum acres specified in TLMP will be maintained as high value habitat. The EIS also indicates that all areas with a HSI of 0.7 were removed from consideration during this project analysis. We would like to know what effect these actions have upon timber sale economics. If these withdrawals are permanent, what effect will these actions have on the USFS's ability to meet the commodity outputs of TLMP in this LUD IV area over the rotation. In an areawide context, we would also like to see a cumulative effects analysis of

these types of decisions on all area plans regarding the ability of the USFS to meet the allowable sales quantity over the rotation.

We would like to see an analysis of the effects of including the new perspective elements. Many of the options included in new perspectives such as internal exclusions, cutting only small sections of timber, etc., will reduce the volume per acre harvested, and/or increase the unit costs of road building and logging. The effects of these decisions on the USFS's ability to provide economically feasible timber sales and to maintain the allowable sales quantity throughout the rotation should be considered. Since there are many different elements of "new forestry" that can be included under new perspectives, we request that this type of analysis become a standard part of each project or area EIS.

Designation of Duncan Salt Chuck Creek:

After reviewing the analysis and considering the "effects of non-designation" (page 5 appendix E), we conclude there is a lack of justification at this time for designating either segment as wild or scenic. We concur that the current analysis for this area identifies unique resource values; however, it appears that the outstanding values of this creek will be adequately protected by the current wilderness designation on segment 1 and the riparian protection standards on segment 2. Lastly, the present status of the creek provides protection of stream resources and flexibility to appropriately manage this system.

The State concludes that designation as part of the wild and scenic river system will significantly impair the State's ability to manage this creek with no realization of additional benefits to the public than presently exist.

The State recognizes that the USFS is required by Section 5(d) of the Wild and Scenic Rivers Act to study possible additions to the Wild and Scenic River System (W&SR) as part of its resource management planning process. We also understand that the USFS maintains, at this time, that ANILCA Section 1326(b) (the so-called "no-more clause") is not applicable in this instance, nor to the TLMP revision, as both processes are not for the single purpose of considering the establishment of a conservation system unit (CSU)."

Notwithstanding these considerations, the State recommends that the DEIS include alternatives to W&SR designations. There are numerous administrative options for managing recreation and/or important resource values without Congressional designation of new CSUs. The TLMP revision currently in progress is the appropriate vehicle for accomplishing this. When the draft TLMP supplement is released, the State will scrutinize any rivers proposed as "suitable" under the following criteria, among others:

- Do these rivers possess unique or outstanding features in the context of the region and Alaska as a whole?

- What effects are anticipated in the adequacy of the timber supply to meet industry needs in southeast Alaska?

- Based on land status considerations, what role will the USFS have in managing the river corridors?

- Would potentially viable hydroelectric developments be precluded?

- Would existing or potential mining activity or other development activities be unreasonable curtailed or precluded?

- What new recreation opportunities would be created? How would existing recreation use be affected?

- How would potential increases in recreation use affect subsistence/local use, e.g., competition for resources, disturbance of wildlife?

- Would existing or potential access opportunities (for development, transportation, recreation, subsistence, etc.) be unreasonably curtailed or precluded?

The USFS should also refer to A Synopsis for Guiding Management of Wild, Scenic and Recreational Rivers in Alaska, adopted unanimously in November 1982 by the Alaska Land Use Council. These guidelines, approved by the Solicitor's and Attorney General's office representatives, address a full range of management concerns that should be addressed in these studies.

Page-specific NEPA comments:

Page 2-2: The DEIS describes the new perspective element "internal exclusions" as "some trees within the harvest unit left to achieve structural diversity, visually screen roads, and modify block unit shapes." Implementation of these exclusions should be designed to include large dominant trees to withstand windthrow. In discussing internal exclusions, the statement is made: "A process of cutting only sections of timber would be applied in this sale, in order to mimic blowdown patches in southeast Alaska. . . . Impacts to wildlife would approximate those occurring under natural ecological processes." Presumably this refers to small stands 10 to 20 acres in size harvested by helicopter. We question this statement because of the considerable differences in wind resistance (which affects susceptibility to future windthrow) between clearcuts and blowndown timber and the sheer

number of units as contrasted to normal windthrow patterns. A further discussion of this topic is desired.

Page 3-21: We would like to see the number and locations of surveyed bald eagle nests in the FEIS.

Page 4-16: The latest iteration of the deer habitat capability model (2/5/91) given to us by the Forest Service shows a much lower current habitat capability in the study area than depicted in Figure 4-1, page 4-16 or stated on page 4-24. The total for VCU's 424 (1,007 deer) and 442 (379 deer) is 1,386 deer. We have no breakdown for VCU 441.1, which is part of the study area. The habitat capability for all of VCU 441, the majority of which is in wilderness and outside the study area, is 326 deer. Even counting all of VCU 441, the total current deer habitat capability for the study area is 1,712, not 2,736 as stated in the DEIS.

The difference may be due to different snowfall scenarios in the models used. On page 3-16, the DEIS states the HSI deer model used assumed "moderate" snow levels. This implies the intermediate as opposed to low or high scenarios. If the low snow level was assumed, it should be clearly stated in the EIS. The model outputs we have are based on an intermediate snowfall scenario. Because the entire study area is in an historically intermediate snowfall zone (with the exception of VCU 441.1 which is in a heavy snowfall zone) using the intermediate snowfall scenario would best approximate deer habitat capability over the long term.

Intermediate snow scenarios should be used for all indicator species. Compared to model outputs we have received from the Forest Service, marten habitat capability in the DEIS appears high, whereas black bear and otter habitat capabilities appear to be low in the DEIS. Clarification on the version of the models used for each species should be included in the FEIS.

Page 4-16: The DEIS states that habitat capability model outputs for deer and river otter were unilaterally "corrected" by the Forest Service to correspond with field observations. While this may be appropriate, as coauthors of the habitat capability models, DFG personnel involved in developing the models should be consulted before models are "corrected" or adjusted. Field studies on which adjustments are based should be well documented.

A conversation between DFG and a USFS biologist on 6/27/91 indicated the corrections made to the deer model output along the Frederick Sound shoreline (page 4-16) were made only to a 500-foot wide strip of beach fringe on the

coast. There does not appear to be a basis for limiting the corrections to a 500-foot wide strip of beach fringe, a designation that does not occur in the model. All land up to the 800-foot elevation (an existing model category) should be subject to such "corrections".

We request a meeting between DFG personnel involved in developing the model and USFS personnel to discuss the model corrections before finalizing data for the FEIS.

P. 4-19, Par. 4: Old growth patch size. Old growth blocks will not meet the habitat requirements of dependent species unless they have the proper composition of habitats. Number and size of blocks alone is not sufficient for ecosystem biodiversity. Thus, the last sentence should be changed to "For comparison purposes, the greater the number and size, and the better the quality of well-distributed forest blocks, the greater the opportunity for species viability and ecosystem biodiversity for most southeast Alaska plant and animal communities."

Page 4-22: We estimate historical annual demand (based on estimated harvest 1960-68) as being 80 deer in Wildlife Analysis Area (WAA) 5135 and 180 deer in WAA 5136 (part of which is in the study area). Based on a sustainable annual harvest rate of 10%, deer needed to meet hunter demand in WAA's 5135 and 5136 are 800 and 1800 respectively.

Page 4-42: Information on the harvest by volume class for each alternative and the percent of each volume class including projected board feet of timber that will be cut in each alternative should be displayed clearly in the FEIS. The interest in such information and its importance in analyzing timber sales is reflected in Section 301(c)(2) of the Tongass Timber Reform Act (TTRA), which prohibits disproportionate harvesting of the higher volume classes of old growth timber. Although this provision is subject specifically to the two long-term timber sale contracts, it similarly raises concerns for the independent sale program regarding the economic viability of future timber harvesting and impacts on old-growth dependent wildlife.

If only acres of volume classes are considered, comparison of tables on pages 3-43 and 4-44 showing percentage of CFL by volume class and proposed harvest by volume class for each alternative indicates that the preferred alternative will take 17% of the cut from volume class 4, 72% from volume class 5, and 10% from volume class 6. Volume class 5 is thus greatly overharvested in proportion to its occurrence, whereas, volume class 4 is

greatly underharvested. We would like to see a similar display by projected board feet of timber in each unit.

Counting existing clearcuts, 16% of the acres of volume class 6 will be cut while only 11% of the acres in the analysis area are in that high volume class. This harvest of volume class 6 disproportionate to its occurrence is of concern given the high value of higher volume classes to wildlife. Disproportionate harvest of both volume class 5 and 6 in comparison to volume class 4 in the early entries of timber harvest also makes the job of future forest managers much more difficult. Further discussion of volume class harvesting with respect to the planned rotation is warranted.

Maps 3-7/2-5A: According to these maps, a considerable amount of high value deer habitat is slated for cutting in the preferred alternative. Although this has little effect on current subsistence use or other deer hunting because the hunting seasons are closed, loss of high value habitat may slow the rate of recovery of the deer population to huntable levels. The EIS should acknowledge this. Also, although many subsistence hunters have probably shifted deer harvesting to other areas, others may have stopped or reduced hunting efforts with the closure of areas near their communities. Sigman and Doerr noted the percentage of licensed hunters in Petersburg and Wrangell declined after the closure of Mitkof and Kupreanof Islands to deer hunting in 1975. A similar reduction in hunters may have occurred in Kake as well. It should not be assumed in the EIS that all subsistence hunters will be able to meet their needs elsewhere.

PRELIMINARY ACMP COMMENTS

If the following concerns are not addressed in the final EIS, the State may request alternative measures in the State's consistency determination based on the 1990 Forest Resources and Practices Act, which provides the ACMP standards for Forest Service timber sales. AS 41.17.900(b)(1), Applicability, states "for federal land the degree of resource protection may not be less than that established by this chapter for state land except that AS 41.17.119 establishes the minimum riparian standard." Based on AS 41.17.060(a) through (c), the following ACMP issues are preliminarily raised:

1. Soil stability. In Forest Practices Act Section 41.17.060 (b) (5) the standard states "significant adverse effects of soil erosion and mass wasting on water quality and fish habitat shall be prevented or minimized. An ACMP issue in the FEIS will be soil stability, particularly in relation to the proposed road

system. For example, the "north route" would cross 5 deep V-notches in which "very unstable" soil conditions have been identified. These V-notches drain into Duncan Salt Chuck Creek, an anadromous fish stream. In addition, the siting of any units in proximity to these V-notches could subsequently result in windthrow in the V-notches which may, in turn, trigger mass wasting with significant adverse effects on downstream fishery resources. To find the proposed timber sale consistent with the ACMP, we will need to be assured that these high hazard soils areas are being avoided during road construction and that units are designed, to the maximum extent practicable, with windfirm buffers between the units and V-notches or other unstable soils areas.

2. High hazard soils. On page 4-7, Table 4-4 indicates 35 acres of high hazard soils will be harvested under the preferred alternative. Information on these acres including location and mitigation to protect downstream water quality will be needed for our ACMP review of the FEIS.

3. Stream crossings. The DEIS also indicates that 21 stream crossings will be constructed under the preferred alternative. A portion of these will be over anadromous or resident fish streams. The State's consistency review extends to these activities, which may also require other State or federal authorizations. DFG believes these actions also require approval per AS 16.05.870 or AS 16.05.840 prior to construction. Approval of stream crossings may include timing conditions as well as other design features. It is DFG policy that bridges are needed when crossings are over salmon spawning habitat. Information provided in the DEIS (and most FEIS documents) is inadequate to allow identification of site-specific measures that may be required to approve these crossings under ACMP and Title 16 at this time. To ensure consistency, additional information in the FEIS should include stream substrate information, type of habitat at the site, stream widths, fish specialists reports, photographs of the crossing sites and information on the structures proposed at each site. On-site inspections may be required.

4. LTF. The preferred alternative calls for use of the Hamilton Bay TTF for transfer of the logs to salt water. Since the original permit was issued to build a TTF at Hamilton Bay, DFG has determined that the bay is a herring spawning area. These herring are harvested each year for subsistence purposes by residents of Kake. To protect these herring and their eggs, timing restrictions on use of the TTF may be needed during the period when herring are spawning and eggs are incubating in the area of log transfer and storage. Information on the specific location of spawning areas and further consultation

with the State and the City of Kake is recommended. Discussion of the usage of existing LTFs continues in the general advisory section of this letter.

5. Unit/road cards. To enable us to complete an ACMP review of this sale, including each unit and road, we request unit and road cards be included in the FEIS as has been done in other recent final environmental documents.

6. Roads. On page 4-8, Table 4-5 indicates that 0.2 miles of road will be constructed across high hazard soils areas under the preferred alternative. Locations of these areas and planned mitigation will be needed to complete our ACMP review of these road segments.

GENERAL ADVISORIES

As discussed in the preliminary ACMP issue No. 3, the DEIS states that the preferred alternative will utilize existing LTFs in Portage Bay and Hamilton Bay. It is helpful when environmental documents provide background information about existing facilities, such as State review numbers and status of permits (viable or expired). If timing restrictions are indeed necessary for the log transfer facility, it would be best to attach the timing restrictions to the transfer facility rather than the timber harvest activity. More information on the location of herring beds is needed before such action would be recommended.

The preferred alternative indicates that 8.3 miles of streams will have timber harvest within a minimum 100 feet of the watercourse (the second highest potential impact of all alternatives. We believe it is essential for the units to be designed, to the maximum extent practicable, to ensure windfirm buffers along anadromous fish streams and resident fish streams which require 100-foot buffers.

The State commends the USFS for including new perspectives elements in this project. We also appreciate the implementation of best management practices by planning no units for cable yarding in high hazard soil areas. Also, the proposed buffers in riparian, beach fringe, and estuarine areas will help protect water quality as well as maintain productive wildlife habitat.

We look forward to working with the Forest Service during the completion of the FEIS.

Laura Nelson 15 August 7, 1991

Thank you for the opportunity to comment.

Sincerely,

Lorraine Marshall

Lorraine Marshall
Project Review Coordinator
SE Consistency Review Section

cc: Daryl McRoberts, DNR, Juneau
Don Cornelius, DFG, Petersburg
Rick Reed, DFG, Juneau
Jim Ferguson, DEC, Juneau

bts.wp5 co2

H Appendix

United States
Environmental Protection
Agency

Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

EPA

AUG 16 1991

REPLY TO
ATTN OF: WD-136

Ronald R. Humphrey
Forest Supervisor
Stikine Area
Tongass National Forest
P.O. Box 309
Petersburg, Alaska 99833

Dear Mr. Humphrey:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and s 309 of the Clean Air Act, the Environmental Protection Agency has reviewed the **Bohemia Mountain Timber Sale** Draft Environmental Impact Statement (draft EIS). This draft EIS evaluates five timber harvest alternatives. The action alternatives range from 10.9 to 39.6 million board feet with area harvested ranging from 384 to 1,635 acres.

Based on our review, we have rated the draft EIS EC-2 (Environmental Concerns - Insufficient Information). Our main concern is the possible effect of the action alternatives on water quality and fisheries. Additional information is needed on monitoring, and mitigation. This EIS has a generally clear presentation of alternatives. Our detailed comments are enclosed.

Thank you for the opportunity to review this draft EIS. Please contact Wayne Elson at (206) 553-1463 if you have any questions about our comments.

Sincerely,

Ronald A. Lee

Ronald A. Lee, Chief
Environmental Evaluation Branch

Enclosure

cc: Drew Grant, ADEC
ADFG
NMFS

Stikine Area
AUG 22 '91
Forest Supv.
P.I.O.
A.O.
Eng. Staff
F&WL Staff
Planning Staff
RL Staff
S&W Staff
Timber Staff
Pabg. Dist.
Wmgl. Dist.

Detailed Comments for Bohemia Mountain Timber Sale Draft Environmental Impact Statement

Water Quality and Fisheries

Several statements in the draft EIS concerning water quality and fisheries appear contradictory:

> "It has been extremely difficult to determine specific cause-and-effect relationships between some forest management practices and variations in salmonid populations." (page 4-10) "Crude measures of relative, not absolute, risk to fisheries..." (page 4-11) "All of the alternatives would present some risk [to fisheries]." (page iii) "A small amount of soil sliding and slumping is likely." (page 4-7) "No noticeable long-term effects should occur as Southeast Alaska watersheds tend to recover quickly due to the resilience of the forest vegetation." (page 4-6). 1

These apparent contradictions should be resolved in the final EIS. We conclude that because reliable prediction methods are unavailable and the uncertainty of the water quality effects of timber harvest, a high amount of conservatism is needed and increased attention to implementation and effectiveness monitoring is needed.

All potential harvest units must have topographic detail and sufficient scale to identify after courses, landings, and road locations and slope steepness. The detail presented should be similar to that provided in the sale plan and contract. Water sources for road construction and rock source location should also be identified. 2

Monitoring

A detailed description of the feedback mechanism is needed. It should use monitoring results to adjust standards and guidelines, best management practices, standard operating procedures, intensity of monitoring, and timber sale administration when adverse effects are first detected. Providing such a mechanism for adjustment will ensure that mitigation will improve in the future and that unforeseen adverse effects are recognized early and minimized. 3

Details of the monitoring plan need to be expanded and included in the final EIS. It should include types of surveys, location and frequency of sampling, parameters to be monitored, indicator species, budget, procedures for using data or results in plan implementation, and availability of results to interested and affected groups. Linkage to Alaska Department of Fish and Game (ADF&G) Numbers Streams and specific harvest units would be appropriate and useful.

Mitigation

Site specific details on the effectiveness of mitigation are appropriate for a site specific timber sale. The final EIS should provide a quantitative (if possible) or qualitative description of mitigation effectiveness. Prior timber sales in the Tongass National Forest could be used as a basis for these discussions.

A comprehensive discussion of proposed mitigation for direct, indirect and cumulative impacts is required by the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA. The CEQ regulations indicate that an EIS should include the means to mitigate adverse environmental effects (40 CFR 1508.7) as well as disclose the effectiveness of the mitigation measures to minimize adverse effects.

This need is fully consistent with EPA's Antidegradation Policy (40 CFR 131.12). This policy includes provisions that: No activity is allowable which would partially or completely eliminate any existing beneficial use of a waterbody, whether or not that use is designated in a state's water quality standards. In such a circumstance, the planned activity must be avoided or adequate mitigation/preventive measures must be taken to ensure that the existing uses and the water quality to protect those uses will be fully maintained. 4

Federal Consistency Provisions of § 319 of the Clean Water Act

§ 319 includes water quality assessments and a nonpoint source (NPS) management program. The assessment identifies water that cannot reasonably be expected to attain or maintain applicable water quality standards or goals without control of nonpoint sources. The NPS program identifies Best Management Practices and programs to achieve implementation.

The Federal consistency provisions of § 319 represent an opportunity for State and Federal agencies to more closely coordinate their activities and cooperate in achieving water quality goals. If the State determines that a Federal application or project is not consistent with the provisions of its NPS program, the Federal agency must make efforts to accommodate the State's concerns. Executive Order 12372 provides guidelines for using the State intergovernmental review process for conducting § 319 Federal consistency reviews.

This final EIS needs to integrate § 319. The Affected Environment and Environmental Consequences chapters need to reflect and reference the state's water quality assessment. Direct or indirect nonpoint source water quality effects need to be reduced though design and through mitigation measures to insure that the project is consistent with the state's NPS program. The contact for the Alaska Department of Conservation is: 5

Drew Grant
Nonpoint Source Coordinator
Alaska Department of Environmental Conservation
P.O. Box O
Juneau, Alaska 99811
Phone: (907) 465-2653

Other Specific Comments

1-1 It is unclear from the discussion of purpose of the project just what the past present and future demand is for timber from the independent industry. To what extent is Bohemia Mountain timber meeting the independent industry demand? Are there interested bidders? } 6

2-4 Under the no action alternative, when would this area be considered again for harvest (145 million board feet)? What is the time period of no action? The long term implications of the no action alternative needs to be explained. } 7

2-20 How are corrections made of mistakes (feedback) made during implementation by the sale administrator? How are implementation monitoring results fed back into the planning process? } 8

2-20 More information is needed on effectiveness monitoring. What are the specific monitoring activities that are planned? What is the rationale for the level of monitoring planned? See **monitoring** comments section. } 9

3-3 Have existing roads and clearcuts caused any watershed degradation? Have the existing roads and clearcuts been monitored for adverse effects? } 10

3-9 High hazard soils are located at or near a proposed road and proposed cable unit 509 for Alternative 5A. How will adverse effects be prevented? } 11

3-11 ADF&G numbered stream data is listed. What are the effects to habitat quality in each value comparison unit for all the action alternatives? Effectiveness monitoring plans should be expanded to relate to this. } 12

4-3 The water quality beneficial use "limiting factor" or "parameter on concern" should be discussed further and how the project alternatives will effect it. Sedimentation is alluded to, but it unclear if that is the main "limiting factor." } 13

4-4 The text states that greater road length [road density?] results in higher risk of water quality degradation according to the text. Have road density and water quality degradation been correlated on the Tongass? What road densities have resulted in monitored problems? } 14

4-6 The draft EIS uses a cumulative effects model developed by McCorison, et al. (1988) to estimate watershed harvest thresholds of concern. Has the model been field tested? What were the results? Has the model been test run on watersheds where the threshold of concern had been exceeded from previous activities? } 15

4-6 "No noticeable long-term effects should occur as Southeast Alaska watersheds tend to recover quickly due to the resilience of the forest vegetation." This statement needs to be supported by documentation and references. } 16

4-11 "Risk of other indirect effects" to fisheries needs to be explained further. } 17

4

4-11 In order to gain a better understanding of absolute risk to fisheries the risk factors should be used with existing comparable watersheds that have been logged. Several reference watersheds could be established. } 18

Letter from Ronald A. Lee, Environmental Protection Agency

Comment 1: "Several statements in the draft EIS concerning water quality and fisheries appear contradictory."

Response 1: These statements have been addressed in the final EIS. They were intended to point out the difficulty in determining actual effects of management activities as they indicate the level of risk involved.

Comment 2: "All potential harvest units must have topographic detail and sufficient scale to identify after courses, landings, and road locations and slope steepness."

Response 2: Topographic lines have been added to the alternative maps located in Chapter 2. Appendix F, Unit Descriptions, contain detailed unit-by-unit descriptions and drawings.

Comment 3: "A detailed description of the feedback mechanism [for monitoring] is needed."

Response 3: The monitoring section in Chapter 2 has been expanded to reflect these concerns. See response 8 below.

Comment 4: "The final EIS should provide a quantitative or qualitative description of mitigation effectiveness....[to include] direct, indirect and cumulative impacts [as] required by the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA.

Response 4: Mitigation measures employed in the alternatives are either measures that have been routinely employed here and elsewhere (such as eagle nest buffers or cultural resourse protection) and are known to be effective, or the measures are relative new ones (such as TTRA streamside buffers and BMPs) and will need to be monitored to assess effectiveness. (See monitoring section in Chapter 2.)

Comment 5: "The Federal consistency provisions of §319 represent an opportunity for State and Federal agencies to more closely coordinate their activities and cooperate in achieving water quality goals.... This final EIS needs to integrate §319."

Response 5: Many of the considerations inherent in the design process are aimed at achieving water quality goals. (See the discussion of the process used to design alternatives in Chapter 2.) The use of BMPs are part of this process. The State of Alaska has commented on the Draft and will also provide input on consistency with the Coastal Zone Management Plan, which includes the NPS program.

Comment 6: "It is unclear from the discussion of purpose of the project just what the past present and future demand is for timber from the independent industry. To what extent is Bohemia Mountain timber meeting the independent industry demand? Are there interested bidders?"

Response 6: The timber harvest level for the Tongass National Forest is established in the Tongass Land Management Plan based on several considerations, including overall demand for timber. It is not practical or necessary to re-evaluate demand for each project; however, the continuing interest in independent timber sales indicates that there continues to be a demand for timber from independent industry.

Comment 7: "Under the no action alternative, when would this area be considered again for harvest (145 million board feet)? What is the time period of no action? The long term implications of the no action alternative needs to be explained."

Response 7: Unless expressly stated in the decision, selecting the No Action alternative would not place any restrictions on the time in which another project could be considered in the Bohemia project area. This would remain so as long as the area is allocated to a LUD that allows timber harvest.

Comment 8: "How are corrections made of mistakes (feedback) made during implementation by the sale administrator? How are implementation monitoring results fed back into the planning process?"

Response 8: Sale administrators, as well as contract inspectors for the road construction, have the authority to halt the purchasers operations and require corrective actions when problems are encountered. The resource specialists involved in the planning effort are frequently called in to help correct problems encountered during implementation. This assures that the original intent of the project design is maintained and provides the specialist with feedback on how well the project design meets the objectives.

Comment 9: "More information is needed on effectiveness monitoring. What are the specific monitoring activities that are planned?"

Response 9: The monitoring section has been updated and now contains the information you requested.

Comment 10: "Have existing roads and clearcuts caused any watershed degradation? Have the existing roads and clearcuts been monitored for adverse effects?"

Response 10: Existing roads and harvested units in the study area are limited to the east side of Portage Bay and are located in very small watersheds running directly into the bay. Montioring to date has been limited to implementation monitoring during timber sale administration. No watershed degradation has been recorded.

Comment 11: "High hazard soils are located at or near a proposed road and proposed cable unit 509 for Alternative 5A. How will adverse effects be prevented?"

Response 11: The road is located low on the slope below the area of concern. After field verification of unit 509 it was determined that the unit is actally located on moderately high hazard soils. The adverse effects are prevented by avoiding high hazard soil areas and through the application of BMPs.

Comment 12: "ADF&G numbered stream data is listed. What are the effects to habitat quality in each value comparison unit?

Response 12: The effects to habitat quality in each value comparison unit for all the action alternatives have been put in Table 2-1. Effectiveness monitoring has been expanded in Chapter 2. An effectiveness monitoring program is being developed on a Forest-wide basis in consultation with the State of Alaska. Whether or not the Bohemia sale itself will be monitored with this program has yet to be decided. If this study area is not monitored, another area representative to the Bohemia will be monitored with the results being applicable to the Bohemia area. Monitoring that will be done on the Bohemia sale includes effectiveness of buffers on sedimentation and habitat change, management prescriptions on sideslope disturbance on Class III streams that do not require buffers, and fish passage through culverts on Class I and II streams.

Comment 13: "The water quality beneficial use 'limiting factor' or 'parameter on concern' should be discussed further and how the project alternatives will effect it. Sedimentation is alluded to, but it unclear if that is the main 'limiting factor.'"

Response 13: This is a complex question due to the inherent variability of natural aquatic and biotic systems. "Degraded" water quality refers to some change, either an increase or decrease, beyond an established range of values for a given parameter. "Degraded" must also be viewed in terms of what beneficial use is of concern and what risk is involved.

Most often the parameters considered when determining whether or not there is water quality degradation, relate to sediment load, water temperature or water chemistry. For sedimentation, parameters which could be measured are: suspended sediment, turbidity, bedload, and channel cross-sectional measurements. For water temperature, measurements can be made using either a thermometer or an electronic sensor. Parameters to consider in relation to water chemistry include pH, conductivity, dissolved oxygen, nutrients such as nitrogen and phosphorous, and various elemental ions.

The parameters selected to determine water quality degradation are determined by the site-specific conditions and resource concerns. Sedimentation is probably the limiting factor in regards to timber harvest in this area, due to the wide extent of soils developed from glacial tills and clays.

Comment 14: "The text states that greater road length (road density?) results in higher risk of water quality degradation according to the text. Have road density and water quality degradation been correlated on the Tongass? What road densities have resulted in monitored problems?"

Response 14: We have no direct studies completed on the Tongass to date. However, it is generally accepted that increased road density can be correlated to increased sediment (other factors being equal, i.e., similar watersheds).

Comment 15: "The Draft EIS uses a cumulative effects model developed by McCorison, et al. (1988) to estimate watershed harvest thresholds of concern. Has the model been field tested? What were the results? Has the model been test run on watersheds where the threshold of concern had been exceeded from previous activities?"

Response 15: It has not been field tested to date. The original model has been revised to include a recovery factor.

Comment 16: "'No noticeable long-term effects should occur as Southeast Alaska watersheds tend to recover quickly due to the resilience of the forest vegetation.' This statement needs to be supported by documentation and references."

Response 16: This comment cannot be supported by documentation. It has been removed from the text.

Comment 17: "'Risk of other indirect effects' to the fisheries needs to be explained further."

Response 17: Indirect effects are those effects which are not directly planned for. By following the Best Management Practices and the Tongass Timber Reform Act guidelines, there is very little effect to the riparian area of Class I and II streams, thus reducing the risk of the indirect effects. The potential of blowdown to buffers is one indirect effect that is considered when planning the unit layout. Where possible, the buffer location is parallel to the prevailing direction of storms and/or is extended to a windfirm topographic boundary. Class III streams are also protected with the Best Management Practices and the Tongass Timber Reform Act, also reducing the risk of the indirect effects on these streams. Refer to page 4-11, Buffers.

Comment 18: "In order to gain a better understanding of absolute risk to fisheries the risk factors should be used with existing comparable watersheds that have been logged. Several reference watersheds could be established."

Response 18: The recent development of Best Management Practices and recent Tongass Timber Reform Act legislation requiring mandatory minimum 100' uncut buffers on all Class I and Class II streams that flow directly into Class I streams has not been applied to past sales that have been managed and are in the monitoring process at this date. Therefore, comparing past sales to present sales and their effects on watersheds is not an equal comparison since design and mitigation measures have significantly changed.

Appendix I

APPENDIX I

Potential Sale Area Improvement Projects

The following projects are proposed for inclusion into the Sale Area Improvement Plan which will be prepared for the Bohemia Mountain Timber Sale. The type of funding (where the money comes from) will be dependent upon the project and the amount of revenue generated from the timber sale.

Regeneration Surveys	All harvest units will be surveyed to ensure adequate restocking of units. A total of 1,270 acres will be field checked. These will be funded out of timber sale receipts. Adequate restocking is likely to occur with natural regeneration.
Precommercial Thinning	The principle objective of the thinning will be to improve wildlife habitat and timber resources. This will be done on existing managed stands along the east side of Portage Bay,which were harvested around 1982-83, adjacent to proposed Bohemia Mountain Timber Sale harvest units. These units will be about 15-20 years old when thinned, within five years of sale closure, making them eligible for funding with timber sale receipts.
Fisheries Enhancement	There is an opportunity to modify a fish barrier on Duncan Salt Chuck Creek and to install egg boxes at a site on stream 110-16-006. Both projects will require feasibility studies and further planning. Cost of these projects may be funded from timber sale proceeds or from appropriated funds.
Visual Design Monitoring	The timber sale will cause a change in the landscape character of this area. A study may be developed to propose dropping a few select trees inside units if they obviously attract attention due to being silhouetted on a ridgetop. This would be conducted with input from wildlife biologists.
Rock Pit Rehabilitation	If pre-development design does not meet desired visual conditions and post-development impacts are visually unacceptable, rehabilitation may be necessary. This may include replacing overburden, or planting, or encouraging the natural growth, of alder and grasses. Rock in this area is expected to be dark in value and either grayish or brownish.
Parking Areas	Development of recreation and sport fishing parking areas where the road crosses creeks could be funded with timber sale proceeds. Trail construction and a parking area along existing Forest Road 6030 leading to Bohemia Lakes could be analyzed and possibly funded using timber sale proceeds or appropriated funds. This project was identified in the Petersburg Ranger District 5-Year Recreation Plan, 1990.
Trailhead Development	There may be an opportunity to construct trailheads in two locations where the proposed Kake/Portage road connection would cross the Portage Mountain Loop Trail.
Trail Construction	A study may be completed to determine the feasibility of a trail opportunity to access a waterfall near helicopter unit 524A.
Wildlife Viewing Area	There may be an opportunity to construct a wildlife viewing area at the head of Portage Bay if the Kake/Portage road connection is built. This would be for a variety of wildlife species. A feasibility study and further planning will be necessary.